

The Mining Journal

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Oh, What a Tangled (U.S.) Web !

CONFRONTED on the one hand with an over-abundance (however temporary) of agricultural produce and industrial minerals, and on the other hand with a rising tide of rebellion against heavy government spending and consequential taxation, the U.S. Administration has been finding that assistance to producers does not flow from a tap which can be turned on or off at will, according to the economic climate.

Mineral producers who pinned their faith in the barter programme have had it shattered by restrictions that are making the benefits from this source virtually negligible. Now the Secretary of Agriculture, Mr. Ezra Taft Benson, has stated roundly that the purpose of barter is "to serve agriculture and not to support a metal programme". From which it must be concluded that the U.S. Government, like providence itself, is on the side of the big battalions !

Some of the present difficulties of the United States Government suggest that very tangled wits can result when sound economic principles are sacrificed on the altar of political expediency.

As for the Administration's attempts to secure Congress approval for some of the remnants of its sadly depleted domestic purchase programme, the obdurate refusal of the House to sanction a mere \$30,000,000 for this purpose has thrown U.S. tungsten producers to the economic wolves at a time when world market conditions are singularly bleak. Paraphrasing Kipling in "Brugglesmith", the mineral producer who puts his trust in government subsidies and stockpile purchase programmes is liable to be let down with an almighty wallop just when he most needs help, but he who relies on commercial shrewdness based on constant study of the supply-demand picture can often manage to sell out before the market crashes.

For those U.S. producers who hope, like Mr. Micawber, that something may yet turn up, the latest Bureau of Mines analysis of minerals and metals considered vital to the U.S. economy brings scant consolation. It schedules 13 domestically-mined minerals for Congressional attention next year in an attempt to give their producers an added measure of protection from foreign competition.

According to the Bureau of Mines, economic problems facing the antimony industry are reduced requirements of primary antimony and increased output by foreign producers.

Transport and other advantages allow foreign barite to compete successfully with domestic in coastal areas despite the effective 42 per cent *ad valorem* duty on imports.

Domestic output of cobalt is supported by government purchases and probably could not compete in a free world market at the present consumption level.

A special economic problem of the copper industry is the competition from low-cost foreign metal.

U.S. feldspar producers are faced with competition from substitutes such as nepheline syenite and high potash material from Canada. Fluorspar producers find difficulty in meeting competition from sources on the U.S. market. The greater part of the manganese industry cannot compete with foreign ore. In the case of

ilmenite, only domestic orebodies close to the consumer can compete economically with foreign ores which require little rail transport. The small size domestic market and the low cost of imported materials makes domestic production of strontium unattractive.

Output of strategic sheet mica requires so much hand labour that, without heavy subsidies, domestic industry cannot compete with low-cost labour such as that available in India and Brazil.

And so the story goes.

We have every sympathy with the U.S. domestic mining industry, which—like mineral producers elsewhere—has stepped up output in response to government exhortations and incentives to expand supplies of essential materials in time of need, only to find itself cast aside after the emergency like a mistress who has given not wisely but too well.

We also appreciate the difficulties of the U.S. Administration, whose commendable desire—doubtless not wholly untimely with self-interest—to shoulder its responsibilities to producers is being thwarted by the “pull devil, pull baker” currents of local politics.

Apart from the stonewalling activities of an intractable and highly tax-conscious Congress, the government is handicapped by the foreknowledge that higher tariffs on imported minerals are liable to provoke retaliation in kind from export markets—notably Canada—whose goodwill is of paramount importance to United States industry as a whole.

There is also the unwisdom of playing fast and loose with mineral producers overseas whose offerings, though an embarrassment in the present situation of enormous stockpiles and temporary over-supply, are likely to be urgently wanted at a future date, when the U.S. will again require to supplement its own dwindling resources from every possible source of supply.

PIPE DREAMS THAT CAME TRUE

Hydraulic transportation of solids is by no means a development of very recent origin. In fact, coal was being pumped 660 yds. in Hammersmith before the First World War. During the past decade, however, there has been a resurgence of interest in the hydraulic method, both for the transportation of coal from pithead to washeries and/or its distribution to markets, and as an alternative to hoisting ore in shafts.

The scientific and technical problems of hydraulic transport have been investigated by the British Hydromechanics Research Association at Harlow. The Ministry of Fuel and Power and the National Coal Board are actively interested in this work, which has led to the development of an efficient system of handling coal through pipelines and its installation in a British colliery. Hydraulic transportation has also been studied by Le Laboratoire Dauphinois d'Hydraulique in France and by various research establishments and universities in the U.S. and the U.S.S.R. In Canada the hydraulic method has been successfully applied to the handling of ore in a metal mine, where pieces up to 4 in. are pumped to surface through a 10-in. dia. pipe.

Now comes the news that Eastern Ohio's 108-mile pipeline has carried its first cargo of coal, a 200-ton “slug”, from strip coal mines at Georgetown to the Cleveland Electric Illuminating Co.'s electric power generating plant on Lake Erie. The pipeline is of 10½ in. dia. and cost \$12,000,000.

The first large-scale test was carried out on February 21 this year when about 400 tons of slurry were put into the line. The results could scarcely have been less encourag-

ing, for clogging occurred even before the test slug reached the first booster station, and it took weeks to locate and clear the blockage. The trouble seems to have arisen because the particles were too big. Now that the initial troubles have been “ironed out”, however, the Pittsburgh Consolidation Coal Co., who built the pipelines, are confident that it will do the job for which it was intended, namely to transport 1,700,000 tons of coal annually to the power plant at a saving of \$1 a ton over railway freights.

The success of this large project is likely to be followed by other major developments in hydraulic transportation. For example, the Youngstown district, which is the fourth largest steel-producing region in the U.S., has long been frustrated in its efforts to get a canal for the transportation of its coal from Pennsylvania and West Virginia, and its iron ore from Lake Erie ports. Now some steel firms are backing a new company, which proposed to build a coal-carrying line from the Ohio River at East Liverpool, Ohio, to Youngstown. In Utah a pipeline is being built to transport gilsonite, a hydrocarbon, from mines to a processing plant, while coal pipelines are being considered from West Virginia and Kentucky mines to North Carolina, and also the Chesapeake Bay area.

The view has been expressed that similar pipelines might be used to transport iron ore fines, especially the finely powdered metalics removed from taconite. Though such pipelines could hardly compete with the cheap costs of Great Lakes water transportation, they might be capable of transporting the ore fines economically from Lake Erie ports to inland blast furnaces.

The stage has, in fact, been reached when there appears to be no technical reason why any solid which, without detriment, can be handled in slurry form, should not be transported in pipelines.

As railway freights and labour costs continue rising, it should become increasingly attractive to a number of industries, including mining, both for the transportation of raw materials to treatment or processing plants and for the distribution of coal and other suitable commodities to consumer markets.

ENOUGH TO BREAK YOUR HARP

Rumours are widespread in Dublin mining circles that the various Canadian interests now actively developing holdings in Eire are contemplating cutting their losses by withdrawing from the country, in view of the low price of copper.

The St. Patrick Mining Co. Ltd. of Avoca—the largest mining interest in the Republic and a subsidiary of the Mogul Mining Corporation of Toronto—has admitted that it is pessimistic about the future with the drop in the copper price. An official of the company said that it was the future price of copper which was causing concern since the company hoped to begin shipment of copper ore later this year.

Another Canadian interest, the Emerald Isle Mining Co., which is a subsidiary of Can-Erin Mines Ltd. of Toronto, stated that worry existed over the steady fall in world copper prices. Development work, however, would continue at Allihies, County Cork, where rich deposits of copper had been found.

At Bonmahon, County Waterford, where a third Canadian mining company is carrying on exploratory work on disused copper mines, an official said that while the low price of copper was disheartening, it was hoped to undertake some new experiments designed to reduce mining costs still further. Statements on future policies are expected to be made by the major Irish-Canadian interests in the course of the next week or so.

The World

EVEN in the trade and technical press scant attention has been paid to an admittedly minor change in the ironstone mining industry of North Yorkshire, which is nevertheless invested with profound significance. The Dorman Long Co., which produces about ten per cent of the total U.K. steel output, has reversed its former policy based upon the gradual abandonment of the dwindling ironstone deposits in the Cleveland area.

Having been worked for nearly a century, a number of the local mines have been abandoned, and the aggregate annual output of jurassic ore averaging no more than 600,000 tons is only about ten per cent of what it was in the heyday of the industry at the dawn of the 20th century.

The company has now decided upon more active exploitation of the remaining ironstone reserves in the area. New equipment is being installed to increase production, and a

radior ore fields derives its main import from the expanding requirements of the U.S. industry.

The needs of West German steel and, indeed, of the whole of the countries affiliated to the European Coal and Steel Pool are no less insistent. To nourish an estimated increase of 5,000,000 tons in German steel production within the next three or four years, provision of an extra 9,500,000 tons of iron ore will be required, and M. Rene Mayer, the president of the E.C.S.P., has enunciated the policy of ensuring adequate ore supplies by acquiring interests in ore deposits abroad. Specifically it is disclosed that the German steel industry is actively considering participation in the working of iron ore deposits in French African territories and also an investment in the Brazilian mines whence production of high-grade ores is to be stepped up to 10,000,000 tons per annum.

Amongst foreign suppliers of iron ore to Germany, Sweden still takes first place, but Swedish supplies fall short of the quantities delivered before the war and the German steel magnates are looking hopefully to France to bridge the gap. It is sometimes forgotten that France ranks next to the United States and the Soviet Union as a producer of iron ore, and the extent of the reserves estimated at 8,000,000,000 tons presents no obstacle to the projected

Needs More

training scheme has been introduced to accelerate the introduction of skilled labour.

The possibilities of expansion are, of course, strictly limited, and the fe content of the ore is low, averaging little more than 25 per cent, but the swelling world demand for blast furnace material has attained such dimensions that the smallest accessible deposits cannot be neglected.

In terms of bulk tonnage British steel consumes more iron ore of home than of foreign origin, although in terms of fe content the balance is substantially on the other side. Possibilities of further expansion of British ore production, particularly in the Lincolnshire and Northants areas, are by no means exhausted, but the trend of events points to the need for a more rapid expansion of imported ore supplies which rose from 12,800,000 tons in 1955 to 14,300,000 tons last year and are expected to increase still further in the course of the current year.

British experience is duplicated in most of the principal steel producing countries abroad—with the notable exception of Soviet Russia. It has indeed become axiomatic that the huge capital investments in steel-making capacity cannot yield their full fruits unless very much larger quantities of raw materials are made available.

Mr. Roger M. Blough, chairman of United States Steel Corporation, recently affirmed that some 50,000,000 tons of new steel capacity would have to be provided over the next 18 years to meet the indicated demand, and in this context of planned expansion the availability of ore supplies has become a subject of anxious exploration.

Already the Lake Superior deposits have passed their peak of production, and attention has been directed more recently to the treatment of the vast tonnages of taconite on the Mesabi Range, upon which an estimated investment of about £600,000,000 is planned. Even this will not suffice to satisfy the devouring appetite of American blast furnaces, and the rapid development of the Quebec - Lab-

increase of production from 52,700,000 tons last year to 70,000,000 tons in 1961. Production, in fact, in the first quarter of the current year exceeded 15,000,000 tons, an all-time record, and 40 p.c. of this material was exported.

Developments further afield include the opening of two ironstone mines and a magnesite mine in China, and bigger outputs from the Indian and Venezuelan deposits.

In neither hemisphere, in fact, is there any lack of iron ore. Supply of the required tonnages is primarily dependent on the provision of extraction equipment and transport facilities. But the scale of capital expenditure on these requisite facilities must be a decisive factor.

Iron Ore

Freight charges may be reduced by the provision of specially designed ore carriers of larger capacity and in this respect British steel is probably ahead of its European competitors. Some of these new carriers are equipped with their own discharging mechanisms, and new unloading wharves have been built, or are being built, at the principal British ore ports.

Further progress in these directions must not be delayed. A further speed-up in ore handling is possible and in the siting of new steel plants close proximity to the coast may henceforth be a determining factor in the U.S., the U.K. and in Western Europe.

ALTHOUGH all alumina plants in the United States operate on the same basic process—the Bayer—it is recognized that local conditions cause wide variation between plants in the quantity of water used. Field investigations were undertaken to determine the manner in which each plant used water for plant and process requirements, the conditions peculiar to each plant that would account for the variation in water requirements, and all other factors pertinent to the usage of water.

For example, even though the chemical process for obtaining aluminium oxide from bauxite is essentially the same at all alumina plants, different procedures are employed to cool the sodium aluminate solution before it enters the precipitating tanks and to concentrate it by evaporation of some of the water in the solution. When this evaporation takes place in a cooling tower, water in the solution is lost to the atmosphere and so is used consumptively.

Water Requirements of the

In other plants the quantity of solution in the system is controlled by evaporation in a multiple-effect evaporator where practically all of the vapour distilled out of the solution is condensed to water which may be re-used. The latter method is used in all recently constructed alumina plants, and some of the older plants are replacing cooling towers with multiple-effect evaporators. This one variation of plant practice will make a significant difference in the total water requirements of the plant, and increased the average daily water intake at one plant from 1.6 to 52.0 mgd, but decreased the consumptive use of water.

The variation in water requirements among reduction

The water requirements of the aluminium industry of the United States were surveyed in 1952 and the findings published during 1956 in pamphlet 1330-C by the Department of the Interior. The water requirements surveyed included those necessary for all plant needs, and the investigations did not take into account the immense volumes of water necessary for the production of hydro-electric power.

works is even greater than that appertaining among alumina plants. As gas scrubbers are one of the principal water users in reduction works, this variation is largely accounted for by whether or not gas scrubbers are used and, if so, whether the wash water is re-used. Of the fourteen

reduction works visited during the course of the investigation, all but three were found to use gas scrubbers to wash the fumes before release into the atmosphere. Ducts convey the gases from the reduction pots of the gas scrubbers where the gases are washed by sprays of water which absorb fluorine gas. This gas, if passed to atmosphere, constitutes a nuisance because of its toxic effect on vegetation.

At some works where prebaked electrodes are made, fumes from the carbon plant are also scrubbed. When wash water is re-used it must be cooled, and the method employed to cool it makes a considerable difference in the quantity of water lost to the atmosphere by evaporation. Several reduction works, having an abundance of low-cost water available, find it more economical not to re-use water from the gas scrubbers. The quantity of water used per lb. of aluminium produced at such works is high, and the percentage of the total water intake used for gas scrubbing is also high. At one reduction works where the water from the gas scrubbers is not re-used, approximately 95 per cent of the total intake of 30.9 mgd. is used for gas scrubbing.

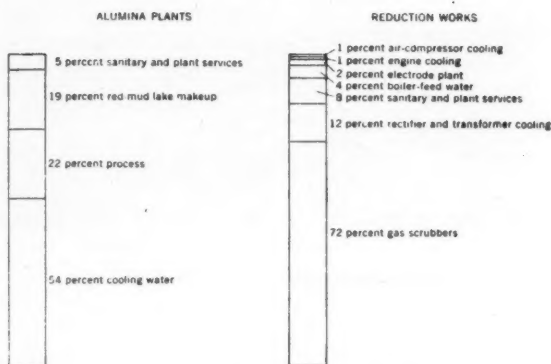
The total water intake for each reduction works, its production of alumina or pig aluminium, and the quantity of water required per unit of product, are facts readily obtainable. The objective of the report encompasses the broader purpose of determining the unit quantities of water used under present conditions for each process and plant use and the minimum requirements under adverse conditions.

The quantity of raw materials required by the aluminium industry is enormous. The two most important elements of cost in the production of alumina and its delivery to the smelter are bauxite and transportation. Taken together they account for 30 to 40 per cent of the net mill costs of primary aluminium and approximately 20 per cent of its selling price.

The largest cost item involved in the smelting of aluminium is electric power. Low cost production depends upon low cost electricity. As approximately 10 kilowatt-hours of



A tower of the transmission line at Kitimat, British Columbia. The water force needed for hydro electric power is lacking in the U.S. aluminium industry



electric power are required to produce 1 lb. of aluminium in the electrolytic cell, a variation of power cost of as little as 0.1 mill per kilowatt-hour has a significant effect upon

Percentage of total water intake for various plant uses

water requirements. It is concluded, therefore, that plant capacity in itself has so little effect upon plant water requirements that other conditions, such as plant operation based on cost of water, plant location, and the need for the conservation of water, mask any economy inherent in plant size.

Although the chemical process is essentially the same in all alumina plants situated in the United States, the manner in which various plants are operated differs sufficiently to make direct comparison difficult. In some plants water from the distribution mains is added to the cycle as hydrate wash water and is charged as such in the plant balance, while at other plants the condensate from the evaporators is used for hydrate wash, and water for this purpose does not appear in the water balance as a

U.S. Aluminium Industry

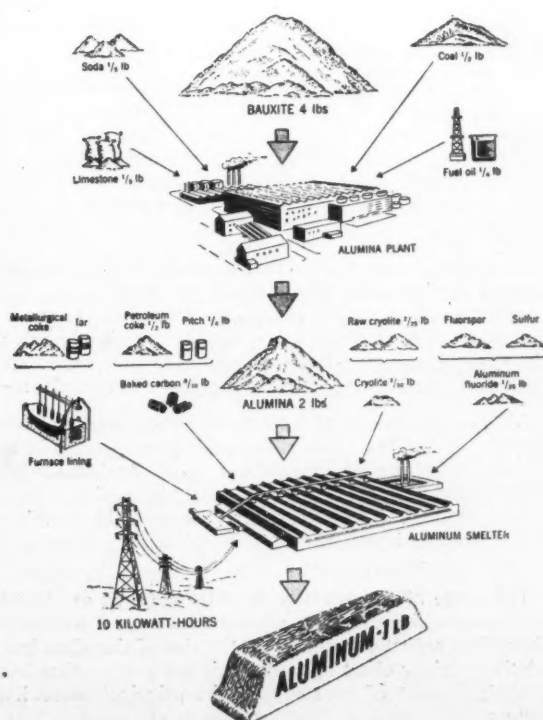
the structure of the full costs of aluminium production. Power shortages and higher freight rates on alumina and pig aluminium have reduced the advantage of low cost electric power. Since the second world war, the need for rapidly expanded production of aluminium has been so urgent that cost of production has become a secondary consideration. Some reduction works were located by necessity near existing sources of electric power, even though the cost of that power was greater than the industry could afford to pay under normal conditions of competition. Such high cost producers became uneconomic when the wartime needs of the military decreased. Some of them were dismantled and others were retained as marginal operators and were put back to production to ease the shortage while new plants were being constructed to meet the industry's second great expansion programme that started in 1951.

The largest use of water at alumina plants is for make-up water to the red mud lake to compensate for losses due to evaporation. If the capacity of a given plant were doubled and the areal extent of the red mud lake were not increased, it follows that the surface evaporation would remain approximately the same as formerly and the unit loss from this cause for the enlarged plant would be less per lb. of product. This assumption is borne out in general by the data obtained in the course of the survey, but the wide variation in unit water use between plants of similar size indicates that other factors have a greater effect on the water requirements of a given plant. For example, the annual quantity of precipitation added to the red mud lake varies by plant location and has a significant effect on the quantity of water added to the lake as make up.

The fourteen reduction works visited during the course of the survey did not have even this slight degree of conformity of economy based upon plant capacity. There is not sufficient uniformity in capacity of the individual plants to permit grouping them by size, neither is there any apparent relationship between plant size and unit

charge against water intake. At other plants, water is taken from the red mud lake and is charged as lake make up.

Water requirements of the electrolytic process used in reduction works are entirely different from the water uses at alumina plants. Despite the fact that the process in alumina plants is a chemical one in which an enormous quantity of liquid re-circulates through the various stages of the Bayer process, the total daily water requirements of all such plants is only about one ninth of the total required by all reduction works: 11.8 mgd. as compared to 104 mgd.



The raw materials and processes required for the production of 1 lb. of aluminium ingot. The most important elements of cost are bauxite, transportation and electricity

Water of good quality for process use is a prerequisite for alumina plants because impurities introduced by process water entering the liquor cycle as hydrate wash tend to accumulate in the caustic soda solution and to impair its function. The quantity of water required for use at aluminium reduction works is a relatively small percentage of the total plant intake. The quality of water used as boiler feed make-up is important, and because reduction works, unlike alumina plants, do not have condensate water as a by-product of the process, all boiler feed water is given such treatment as is necessary.

The principal use for water at reduction works is for wash water at the gas scrubbers, and for this application the quality of the water is unimportant. Brackish water is satisfactorily used at one plant in the gas scrubbers. The average amount of water used for gas scrubbers is 72 per cent of total intake. Thus it is seen that reduction works can be so designed that even brackish water can be used for a major portion of total water intake. Water of high quality, required for boiler feed, averaged only 4 per cent of total plant intake in one instance.

A summary of the water use data of six alumina plants indicates that in 1952 the U.S. industry was using approximately 11.8 mgd. in order to produce 17,900,000 lb. of alumina per day. The unit water use ranged from 0.28 gal. to 1.10 gal. of water per lb. of alumina. The average over the industry was 0.66 gal. per lb. of alumina.

Total Water Intake

A compilation of data from 14 reduction works showed that the total water intake was approximately 104.5 mgd. to produce 7,100,000 lb. of pig aluminium per day. The unit water usage varied even more between reduction works than it did between alumina plants, ranging from 1.24 to 36.33 gal. of water per lb. aluminium. The average for the industry was 14.62 gal. per lb. Installations and modifications to both reduction works and alumina plants that were under consideration at that time were estimated to substantially increase the demand for the water used for process purposes.

However, if the information sought is the average quantity of water required to produce 1 lb. of aluminium from bauxite, not only must the water requirements for alumina production be taken into consideration, but also the fact that approximately 2 lb. of alumina are needed to produce 1 lb. of pig aluminium, making a total water requirement of 15.94 gal.

In conclusion, it is realized that when economic conditions demand it, the water requirements of plants engaged in the production of virgin aluminium from bauxite can be reduced to an exceedingly low quantity per unit of product. The gross plant intake, however, assumes significant volume because of the large production capacity of these plants.

Alumina plants and aluminium reduction works are designed and built as a complete unit. Plant growth in the aluminium industry is not achieved by small additions here and there to accommodate a constantly increasing demand for the product. The water requirements of the completed plant can be designed, therefore, for a known production by a known process.

The range of the quantity of water required at alumina plants is considerable but not nearly as great as that at aluminium reduction works. As the size of the plant has a relatively minor effect upon the unit water use, other local conditions must of necessity be the principal controlling factors.



The camp at access adit No. 3, Chute-des-Passes

ALUMINIUM Company of Canada Ltd. is making steady progress with its vast new hydro-electric power project at Chute-des-Passes on the Upper Peribonka River in Quebec. The project involves blasting a 6-mile long tunnel to connect the reservoir with an underground powerhouse now being excavated. The powerhouse

ALCAN'S

cavern will house five 200,000 h.p. turbo-generators utilizing a gross head of 635 ft. when the reservoir is full. At the powerhouse end, the 35 ft. dia. tunnel will divide into five penstocks. Access to the tunnel is provided by three adits. A force of 3,000 men are employed in drilling.

NEW

When completed, the new project will add 1,000,000 h.p. to Alcan's power network for smelting aluminium, at a cost of about \$150,000,000. First power should flow by summer 1959, while the entire project will be completed by mid-

PROJECT

1960. A new transmission line will be built to carry the power 100 miles south from the new powerhouse to Isle Maligne, where it will be distributed to Alcan's smelters in the area. The facilities will produce an extra 120,000 tons of aluminium in the Saguenay area. The Chute-des-Passes Development is part of an expansion programme for Quebec.

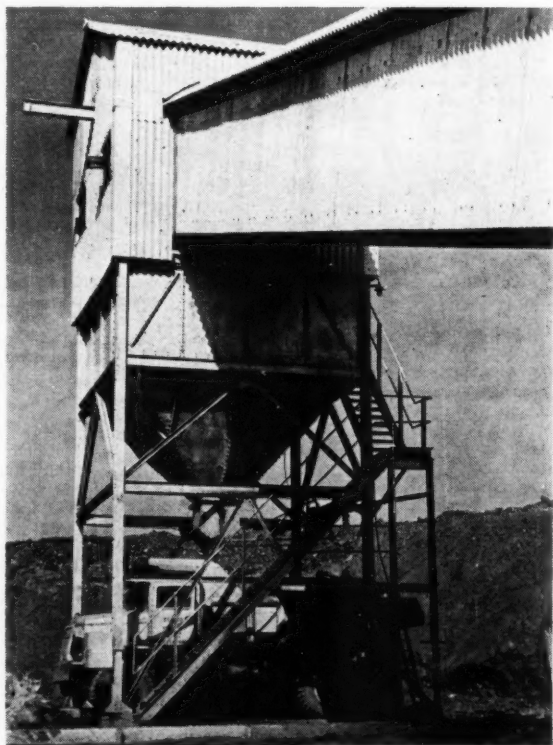
New bridge over the Peribonka River



Developments in the World's Coal

NEW developments in the coal mining industry recently have been reported from the United Kingdom, the United States and Hungary. These developments are the product of company activities and general research.

"Tanalised" timber is used throughout the length of a new waste conveyor at the Prince of Wales Colliery, Pontefract, in walkways on either side of the moving belt. The conveyor housing, being of light construction, allows only small bearing surfaces for the walkway timbers, so that it is important that incipient decay at the joints does not weaken them, and 9 in. x 2½ in. timber, vacuum/pressure impregnated with Hickson's "Tanalith" C preservative has



been used. The conveyor was built by Messrs. Hudswell Clark & Co. Ltd. on behalf of No. 8 Area, North-Eastern Division of the N.C.B.

At the Prince of Wales Colliery the latest method of waste disposal has been developed and put into operation. The main item of equipment is a continuous belt conveyor carrying the waste up to a point near the top of the heap. On arrival the waste is stored temporarily in a large hopper and then distributed by two Euclid trucks. These trucks operate on an extensive road system which is very steeply graded in parts. Because of their manoeuvrability they are able to dispose of the waste in such a way that the heap may be developed in a controlled manner.

A new era in coal mine photography has been opened by the U.S. Bureau of Mines with the announcement that it has developed the first safe photoflash unit for underground use and that commercial firms are free to manufacture the device without licence. The new unit is labelled "permissible", which means that it has undergone an extended period

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of careful testing and can be used anywhere in a coal mine without igniting coal dust or explosive gas.

Firing standard flash bulbs of any size directly from a still camera or by remote control at a distance through a photoelectric circuit, the lightweight unit features a foolproof arrangement which permits bulbs to be removed quickly and safely. Flash bulbs are changed merely by removing the socket base, since no wires are attached.

An eleven-year-old David Brown wheeled industrial tractor is being used as a "main and tail" haulage plant in one of the few remaining privately owned collieries in the U.K. Owned by the Ynismond Colliery Company Ltd., Bryncoch, near Neath, the tractor is used for winching the whole of the coal mine's weekly output of 250 tons from the bottom of the slant to the surface. By removing the offside tyre and attaching a cable to the rim of the wheel, which is driven through the differential gear, the tractor is also used for lowering the empty tubs back to the coal face. Thus a "main and tail" cycle of operation is carried out by the one machine.

The waste conveyor recently installed at the Prince of Wales Colliery, Pontefract

The tractor hauls five tubs, weighing a total of nearly eight tons when fully loaded, eight or nine times a day on a gradient of 1 in 6 for 60 yds. in a distance of 140 yds.

The tractor, which is fitted with a heavy-duty winch, takes only four minutes to haul the tubs from the bottom of the slant to the surface. To prevent downward drag the tractor has been spragged at the rear.

In *Hungarian Technical Abstracts*, Vol. 8, No. 3, Gy. Adorjan reports on the experiments accomplished by himself and his collaborators on the basis of Soviet and Polish literature leading to the development of several up-to-date rotary boring machines—not manufactured in Hungary before—as well as on the tests executed with them and on their production. Investigations had also been extended to the deficiencies of the rotary boring machines employed up to now.

A group of engineers has developed the new type MBF-2-V rotary boring machine equally suitable for compressed air and water flushing, the hollow right-hand spiral drill stem with joint suitable for its operation and the types AF 1—4 eccentric boring heads sunk into the stem and equipped with bayonet catch and screw joint. The boring heads are furnished with previously undercut tips and are suited for the boring of various sedimentary rocks.

The prototypes of the above-mentioned devices have already been completed and the results of the tests are given in a table. Series production has already begun. By the application of these up-to-date new-type boring equipments in soft and medium-hard rocks and besides the increased protection of the workers' health, a 2.5 to 3.5 times greater drilling speed can be attained than has been possible.

MINING MISCELLANY

The Empresa Nacional Funderias, of Chile, has announced a decision to expand and improve the Paipote copper refinery. Machinery and equipment to extend the power plant is to be ordered from the U.K., while units for the converter plant will come from the U.S.

Twenty-two new contracts for minerals exploration were executed by the Defence Minerals Exploration Administration of the U.S. Government during March, April and May, 1957. The total estimated cost is \$1,201,505 and maximum Government participation totals \$676,422.

The discovery of another rich iron ore deposit in Liberia near the Mano River boundary line between Liberia and Sierra Leone has been officially announced. The Liberia Mining Co., which operated the iron ore mines in the Bomi Hills, has applied for rights to exploit the newly found deposits.

Revived interest in prospecting and mining is becoming evident in Kenya, reports Barclays Bank D.C.O. in its current *Overseas Review*. A Kenya company, Ansurfox Mining, Ltd., has obtained an exclusive licence to prospect over an area of 880 square miles in the Narok district. The 12-month licence entitles the company to prospect for precious metals, non-precious minerals, radioactive minerals, and diamonds.

The benefits to be derived in the mining industry from the close co-operation of specialist engineers in the various subject fields and the integration of their experience have been recognized by Ore Treatment and Engineering Services, Ltd. This new company—the Certificate of Incorporation was signed as recently as

late June—has been promoted to provide a comprehensive consultant service to the mining industry by bringing together specialists in every field connected with mining. O.T.E.S. is, we understand, able to undertake consulting work of every kind from geological survey to plant operation.

According to Dr. B. F. J. Schonland, deputy director of the Atomic Energy Research Establishment, Harwell, who arrived in Tanganyika recently on an inspection tour, a considerable amount of money may be spent in the future to aid East African mine-owners. Dr. D. A. Morgan, officer in charge of the U.K. Atomic Energy Authority's East African office in Dodoma, Tanganyika, said that the primary object of his department was to stimulate prospecting for nuclear minerals in East Africa by providing a buying market and by making loans to land-owners.

Consolidated Zinc Pty., Ltd., is investigating the abandoned Astrolabe copper field near Port Moresby, Australia. Its subsidiary, Enterprise Exploration, is conducting the survey. The Astrolabe field produced copper from 1920 until the outbreak of the Second World War. Before the war its ore reserves were estimated at 290,000 tons.

The mining machinery to be purchased by Poland in the U.S. will consist mainly of equipment for open-cast mines. Among the equipment for underground work will be cutters for the driving of galleries in stone, coal-cutters and loaders, air compressors for gas mines, ventilators, colliery radio-communication equipment, and drilling apparatus.

The Sicilian Regional Government has

accepted a proposal by E.N.I.—the Italian State hydrocarbon enterprise—that a new company to be set up in Sicily by E.N.I. should be granted an exploration concession over 180,700 hectares (446,510 acres). E.N.I. is also expected to take part in the general industrialization of Sicily and plans have been drawn up to develop sulphur deposits and to form a local chemical industry.

Plans for a \$20,000,000 copper and molybdenum mining development in Arizona have been announced by the Duval Sulphur and Potash Co. The development is situated 25 miles southwest of Tucson, where the company has been engaged in exploratory work for the past two years. Ore deposits totalling 49,000,000 tons have been discovered. Construction plans call for a concentrator capable of handling 10,000 tons of ore daily.

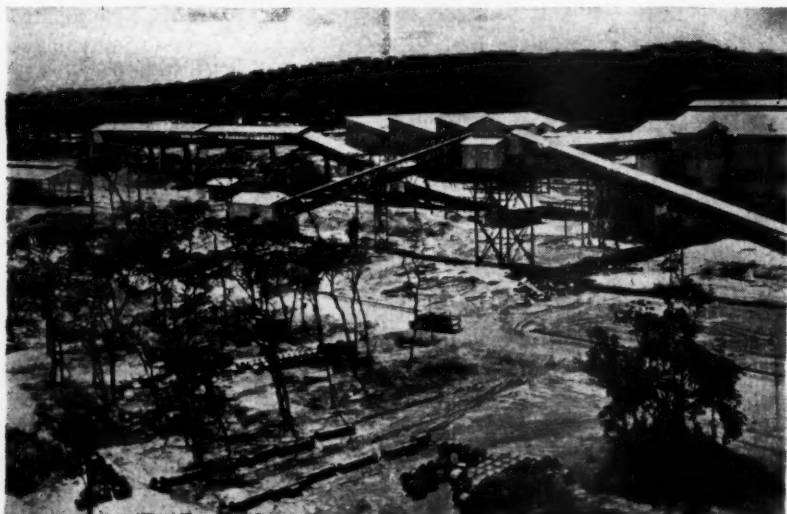
It is reported that a major copper deposit in the Urup area of the Transcaucasus is about to be exploited. It is considered to be one of the largest in the Soviet Union and will provide ore for several decades. The vein is reported to be some 130 ft. wide and the orebody has been followed over a distance of some 28 miles. No average grade was indicated, but some ore was reported to contain 12 per cent copper. In addition, gold, silver, zinc, cobalt and molybdenum have been discovered.

Together with the directors of colliery boards, a special team of specialists, recently set up at the Ministry of Mining and Power, will carry out an analysis of coal deposits throughout Poland with the aim of making production more effective and less expensive. Only strictly economic considerations will be taken into account. The abandonment of barely profitable seams will make it possible to improve productivity and lessen the costs of processing establishments and transport. This in turn will allow increased funds to be utilised for the expansion of active collieries and the sinking of new shafts.

Mineral production in India during 1956 rose to the new peak of Rs. 1,640,000,000—an increase of Rs. 108,000,000 over 1955. Coal was the leading commodity; output amounted to about 39,400,000 tons—an increase of 1,200,000 tons over the previous year—and was valued at Rs. 576,000,000. Other leading minerals were manganese ore (Rs. 247,000,000), mica (Rs. 77,000,000), gold (Rs. 58,000,000), salt (Rs. 55,000,000) iron ore (Rs. 39,000,000), limestone (Rs. 33,000,000) and copper ore (Rs. 30,000,000).

Dr. Albertus van Rhijn, South African Minister for Mines, has announced in the House of Assembly the discovery of copper at Foskor, the Government-sponsored phosphate mining and concentrating venture in north-eastern Transvaal. The deposit is low grade and could only be worked on a very large scale. Two overseas companies, Newport and Rio

Part of the surface plant at the Bancroft mine, in Northern Rhodesia, as it appears from the top of the headgear at the No. 1 shaft, Kirila Bomwe area. The ore bins are on the left, the concentrates handling and loading section is in the centre (saw-tooth roof) and the second- and third-stage crushers and washing plant are on the right



Tinto, have asked for prospecting rights and would spend £500,000 on such work. If successful, said Dr. van Rhijn, they were prepared to spend between £30,000,000 and £40,000,000 in that part of the country. In this case, they would have to take over Foskor. The Government would then pay a fixed rate for every ton of phosphates they took out and would market the phosphates.

The Dominican Republic possesses the largest solid salt deposit in the world. The "Salt Mountain" is located in the province of Barahona, 20 miles from the sea. Until recently it had not been exploited, but the firm of Sal y Yeso Dominicanos, C. por A., by means of a railway connecting the mines to Barahona harbour, has been able to export large quantities of unrefined salt. The Barahona mines produce 600,000 tons of rock salt annually. The firm have announced the construction of a \$1,000,000 salt refinery, which is one of the largest in the American Continent. It will satisfy home demand and provide salt for all the Caribbean countries. Gypsum is an important by-product. The supplies of easily-mined rock salt and gypsum are described as virtually inexhaustible.

At the annual general meeting of the International Wrought Non-Ferrous Metals Council, held in Knokke, Belgium, on June 20, 1957, it was reported that the world demand for copper, while being maintained, had shown no spectacular increase but that an encouraging decline in the tendency to seek substitute materials for copper had been observed, due to the advent of a lower metal price for copper.

In their 1956 report, the management of N. V. Kempensche Zinkmaatschappij, Budel, the sole producer of zinc in the Netherlands, state that 29,131 tons of zinc were produced in that year, this amount being 834 tons more than in the preceding year, and also the highest output ever reached by the company since its establishment in 1892.

PERSONAL

Mr. W. W. Connor has been appointed a director of the Zinc Corporation, Ltd.

Mr. John W. Dykes has resigned as a member of the London Committee and London secretary of Petaling Tin, Ltd. Mr. Edward John Jarvis has been appointed to fill the vacancies thus caused.

Sir Andrew Bryan, a full-time member of the National Coal Board for the past six years, will not, for health reasons, remain a member after July 31, when his present appointment expires. He has agreed to continue his association with the industry in an advisory capacity.

Mr. Victor H. F. Hopkins has taken up office as manager of engineering in the Diesel Engine Division of the English Electric Co., Ltd., with his headquarters at Brownsover Hall, Rugby.

Tecalemit, Ltd., has appointed Mr. A. Muir as manager for the Scottish and Northern Ireland Region, the regional office being situated at 86 Cambridge Street, Glasgow, C.2.



Some of the surface installations at the Kansanshi mine, Northern Rhodesia, as they appear from the main south shaft. The shaft's ore stockpile is in the left foreground; the store lies beyond it. The headframe of the old main shaft is in the centre background. The remains of the old development dump is in the right foreground

Westinghouse Brake and Signal Co., Ltd., have announced the following appointments to the board: Mr. G. W. H. Richardson; Mr. T. J. Aldridge, manager, Signal and Colliery Division; Mr. N. G. Cadman, works manager; Mr. J. W. G. Kershaw, manager, Brake Division; and Mr. L. E. Thompson, manager, Rectifier Division.

Mr. Guy J. Coffey, president of the Chicago Pneumatic Tool Co., New York, and chairman of the Consolidated Pneumatic Tool Co., Ltd., of London, attended a cocktail party in the Park suite, Grosvenor House, on June 21 to meet many personalities of the British business world.

Joy-Sullivan, Ltd., of Cappelw, Greenock, Scotland, have recently made a number of changes in their domestic sales organization. Mr. W. A. C. Muir, who has been the company's Scottish representative, has been appointed assistant field sales manager, to operate directly under Mr. R. T. P. Bell. The Scottish territory is now being covered by Mr. A. Lyall. Mr. G. Hetherington is transferred from the post of representative in the West Midlands and Lancashire to being representative in Durham, Northumberland and Cumberland. He takes over from Mr. E. C. Mullins, who has been appointed field spares superintendent. The West Midlands and Lancashire area will now be covered by Mr. W. S. Scott-Owen, who has re-joined Joy-Sullivan, Ltd.

The sub-branch of the Thika office of the National Bank of India, Ltd., at Fort Hall, Kenya, is now operating as a full-time branch. Two sub-branches of the Fort Hall office have been opened at Embu and Karatina, Kenya.

Viscount Monckton of Brenchley, P.C., K.C.M.G., K.C.V.O., M.C., Q.C., has assumed the chairmanship of the Midland Bank, Ltd., on the retirement of Lord Harlech. Lord Harlech retains his seat on the board.

A specialist group on materials handling has been formed within the Institution of Production Engineers, under the chair-

manship of Mr. A. G. Hayek, of A. G. Hayek and Partners, Ltd., Stoke-on-Trent.

Mr. P. Wiesenauer, retired, formerly a trust officer of Guaranty Trust Co. of New York, has been appointed a director of Burma Mines, Ltd.

The International Finance Corporation has opened a European office on the premises of the International Bank for Reconstruction and Development at 67 rue de Lille, Paris 7. The telephone number will be that of the I.B.R.D. (Babylone 17-10). The I.F.C. and I.B.R.D. have also opened a small office in London at 27/32 Old Jewry, E.C.2 (Monarch 3452).

The Councils of the Iron and Steel Institute and the Institute of Metals have formed a Powder Metallurgy Joint Group, the objects of which will be to study the science, technology and practice of powder metallurgy.

The documents section of the Technical Information and Documents Unit (T.I.D.U.) of the Department of Scientific and Industrial Research has been merged with the Lending Library Unit and operates from 20 Chester Terrace, Regent's Park, London, N.W.1. The telephone number is Hunter 8361.

United Kingdom Ferro-Manganese Co., Ltd. (formerly of 328 Winchester House, Old Broad Street, London, E.C.2), is now at 70 Victoria Street, London, S.W.1.

The new Central Research Laboratories established by the Broken Hill Proprietary Co., Ltd., at Shortland, near Newcastle, were opened on March 5. The guest of honour was Sir Charles Goodhue, director of the British Iron and Steel Research Association. The main buildings of this splendidly equipped research station have a total floor area of approximately 22,000 sq. ft.

The Centenary Celebrations of the South Wales Institute of Engineers will be held at Cardiff on October 29 and 30.

Publications Received

A *Directory of Members* (showing their principal products) and a *List of Films, Film Strips and Wall Charts*, are obtainable from the Aluminium Development Association, 33 Grosvenor Street, London, W.1.

Among the latest additions to the series of Overseas Economic Surveys are the *Belgian Congo and Ruanda Urundi*, by H.M. Consul-General, Leopoldville (price 3s., by post 3s. 4d.); and *Economic and Commercial Conditions in Canada*, by G. Bowen, C.M.G., U.K. Senior Trade Commissioner in Canada (price 11s. 4d., by post 12s. 3d.). Both publications are obtainable from H.M.S.O.

The Geological Survey of Tanganyika has issued Bulletin No. 28, "The Geology of Part of the Eastern Province of Tanganyika", by J. Spence (price 5s.). This paper represents a notable contribution to the study of the Karroo System and its

Reference Manual of German Machine Tools, by H. P. Gentzel, comprises 400 pages with 317 illustrations. The handbook is published in English at £2 7s. 6d. and is available from Publishing and Distributing Co., Ltd., 177 Regent Street, London, W.1.

List 1-2, *Milling Plants in Canada, Part II: Industrial Minerals*, has been published by the Department of Mines and Technical Surveys, Ottawa (price 25 cents). It is intended primarily for the use of mining and metallurgical organizations interested in an inventory of mills treating industrial minerals, but may also be useful to firms engaged in the mill equipment supply business.

The July, 1957, issue of *Platinum Metals Review* contains articles on electrical contact materials for light-duty applications, platinum-clad anodes in the cathodic protection of ships, platinum

A new United Steel employee publication entitled *Savings and Investment* describes in simple terms the principles of shareholding and some methods of investment. It points out that where long-term saving is concerned, there are many advantages in owning shares; and the object of this guide is to show both sides of the question. It also emphasises that industry needs the savings of its work-people to finance its future. The booklet will be distributed on demand to employees of United Steel, but the company make it quite clear that it is not advising employees to do anything. The subject of employee investment was considered at the company's annual conference of Works Councils in 1956, and the information contained in this book was prepared for discussion at the 1957 Conference. In issuing it for wider circulation, the company is merely bringing various investment possibilities to the attention of employees.

In 1955 world economic activity generally reached a new post-war high point, far above the pre-war level, according to the 1956 issue of *The United Nations Statistical Yearbook, 1956*. In that year the world's factories and mines produced about twice as much as in any pre-war year, the world's railways hauled more than twice as much freight, the world's ships carried about two-thirds more cargo and there were over twice as many motor vehicles on the world's roads as in 1938.

World exports in 1955 were 3½ times greater in value than in 1937 but only little more than a half greater in volume, prices having better than doubled over the period. Meanwhile, the world's population was steadily increasing and in 1955, according to the Yearbook estimates, was about one-third higher than in 1930 or about one-fifth higher than in 1940.

This eighth issue of the *U.N. Statistical Yearbook*, containing 650 pages, was prepared by the Statistical Office of the United Nations with the active co-operation of the statistical authorities of over 150 countries and territories and with the assistance of the United Nations specialized agencies and other inter-governmental bodies.

CONTRACTS AND TENDERS

Formosa

The following procurement has been authorized by the International Co-operation Administration (I.C.A.): 6 rock-drilling machines, 4 pneumatic sump pumps, 1 air compressor, 1 mine-car loader, 1 lot of hose couplings, 1 mine hoist, 4 water pumps for a coal mine, 300 drill rods, and 4,800 bits. The project implementation order number is 84-21-007-9-70249 (US-237-C). Bids should be sent to the issuing authority, which is the Central Trust of China, Purchasing Department, 68 Yen Ping Nan Road, Taipei, Taiwan (Formosa). The closing date is 20/7/57. B.O.T. Ref. ESB/15204/57/ICA. Telephone enquiries to Chancery 4411, extension 360.

The Indian State Trading Corporation has announced agreements for the export of over 2,000,000 tonnes of iron ore during 1957-58. The Corporation is negotiating for sales to Japan and Europe and hopes to conclude contracts for substantial tonnages.



The popular Jenbach diesel-driven mobile air compressor. Its compact size enables it to be transported in a standard building hoist

immediate relationships in east-central Tanganyika and in the East African region generally. The possibility of finding workable coal is stated to be remote.

The Russian Section of the London Chamber of Commerce has produced a booklet designed to assist British firms interested in entering the Russian market or expanding their trade with the U.S.S.R. Copies are available from the Chamber at a cost of 5s. Price reductions are obtainable if bulk quantities are ordered.

Marked progress in open-cut mining, particularly for brown coal and construction materials, contrasting with the lower output of gold and black coal, were characteristics of the Victorian mining industry during 1955, states the Department of Mines, Victoria, in its annual report for that year.

alloy permanent magnets, and platinum metals as hydrogenation catalysts. The publishers are Johnson, Matthey and Co., Hatton Garden, London, E.C.1, who are sole refiners and distributors of platinum metals from the Rustenburg Platinum Mines, South Africa.

The continued rise in the price of tin after the second world war led to speculation as to the possible reserves remaining in the Toora tinfield, Victoria, where mining operations were undertaken sporadically between 1888 and 1939. To obtain an estimate of the value of the Toora deposits a geological survey and an extensive drilling programme were undertaken by the Mines Department of Victoria. The results, which are not encouraging, are presented in Bulletin No. 54 of the Geological Survey of Victoria, *Geology of the Toora Tin-Field*, by D. Spencer-Jones.

Machinery and Equipment

Single Line Grease Injector System

A new single line grease injector system is announced by Tecalet, Ltd. The system is based on a new design what is, in fact, a small, simple, automatic grease nipple which eliminates the human factor and ensures that machinery bearings receive a predetermined accurately metered shot of grease at any required time interval.

This new product will have a wide field of application, including belt conveyors, elevators, dredgers, cranes, metal processing plant, etc.

The injector is available in three sizes and is operated from a single pressure line, fed by either a hand-operated or power-operated pump. Electrically fitted pumps can be fitted with an automatic timing device. The three sizes inject .012, .008 and .004 oz. of grease per stroke. They are threaded $\frac{1}{4}$ in. B.S.P. at each end and caps and cones suitable for $\frac{1}{4}$ in. O.D. pipe can be fitted at either end. These injectors can be mounted directly on, or adjacent to, bearings that are to be serviced; in the latter case by grouping in manifolds and piping to the bearings. The grease is injected from the main lubricant supply.

Above: The Tecalet single-line grease injector

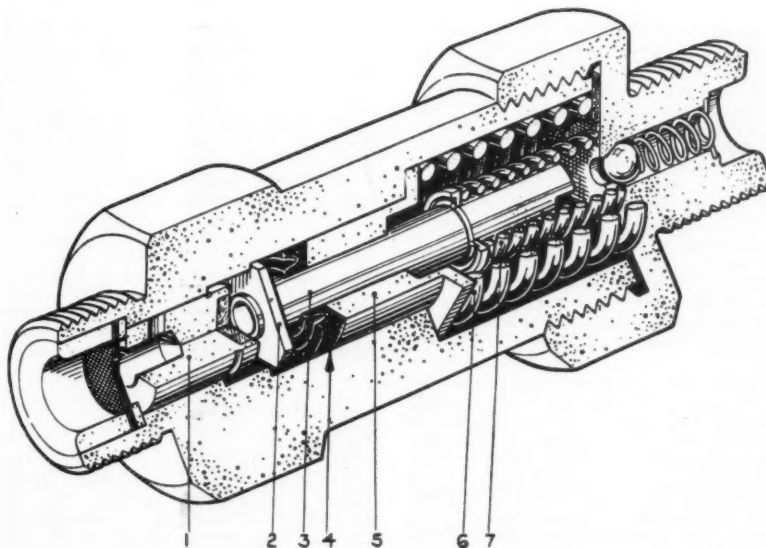
Below: The Hunslet diesel-hydraulic loco for Mufulira

The operation of the new grease injector follows this sequence: Grease pumped at the left-hand end moves the free piston (1) to the right until its nylon facing seals against the left-hand end of the centre tube (3). Now the centre tube is forced to the right against spring (7) until the side drilling in the piston (1) has moved far enough to allow grease to act on the left-hand side of the seal (4) and so to drive it and the piston (5) to the right, displacing grease on the right-hand side of the piston (5) through the outlet to the point of use. Rightward movement of the piston (5) is terminated by the spring (6) going solid.

When grease pressure on the inlet side is reduced to about 150 p.s.i., the spring (7), acting through the centre tube, drives the piston (1) to the left until movement of the centre tube (3) is arrested by the collar (2) meeting a shoulder in the body.

The pressure created on the left side of the piston (5) and the seal (4) by the spring (6) then separates the nylon facing of the piston (1) from the end of the centre tube and the grease on the left of the piston (5) is displaced through the centre tube to the right-hand side ready for the next injection.

The stroke of the piston (5) is controlled by the insertion of spacing washers. A fine strainer backed by a heavy gauze is provided at the inlet to the injector and a ball check valve at the outlet.



LOCOMOTIVE FOR MUFULIRA

The Hunslet Engine Co., Ltd., have recently shipped a 637-h.p. 0-8-0-type diesel-hydraulic locomotive for heavy duties on the 3 ft. 6 in. gauge railway at Mufulira Copper Mines, Ltd., Northern Rhodesia.

This latest Hunslet locomotive has a weight in working order of 56 tons and a maximum axle load of 14½ tons. Maximum tractive effort is 38,000 lb., the top track speed being slightly under 13 m.p.h. Principal dimensions are: length over automatic couplers, 34 ft. 8 in.; overall height, 12 ft. 6 in.; overall width, 9 ft.; coupled wheelbase, 13 ft. 6 in.

Power is provided by a 562 h.p. Paxman 12 RPHL Series II diesel engine

developing 440 h.p. at 1,250 r.p.m. under the site conditions of 4,000 ft. altitude and temperature of 95 deg. F. A separate diesel engine is also incorporated for driving the auxiliaries; this engine being a 75 h.p. Ruston 4 YEL.

Westinghouse straight air brake and screw type hand brake are fitted for locomotive braking, and vacuum braking is provided for the train.

Visco-Alliance couplers and coupler operating gear are fitted at each end of the locomotive.

The locomotive has been shipped to the Port of Beira fully erected except for drawgear, coupling rods, and shunters' platforms, and from Beira it is to travel to Mufulira on its own wheels.



Metals and Minerals

High Prices for "Hot" Nickel

An easing of the nickel shortage in the U.S. is indicated by a steep fall in the price of scrap nickel, which is now selling wholesale in New York at about \$1 a lb., compared with \$2.50 as recently as last November. When scrap is in ample supply, it usually sells for about 20 per cent less than new nickel, which producers are now pegging at 74 cents a lb. The plunge in scrap prices was triggered by the news that the U.S. Government had declared a moratorium on stockpile purchases, but has doubtless been accelerated by a decline in industrial demand due to the drop in motor-car production and lower steel operations. The Government is also taking less nickel for defence purposes.

Nevertheless, there still appears to be a flourishing market for "hot" nickel. Toronto is reported to be the headquarters of a ring which is allegedly filching nickel metal in Ontario and smuggling it across the U.S. border. The ring is believed to have had a gross turnover of \$100,000 in 18 months, but the police and insurance investigators have not yet managed to identify its members. Nickel anodes, comprising 40-lb. bars of 99.8 per cent metal, are said to have been stolen from ten manufacturing plants in the Toronto area. It is believed that the "hot" nickel is being transported across the border by passenger car, one anode at a time. A Buffalo "outfit" is reputedly buying the metal, which is said to be fetching up to \$5 a lb. in the black market.

Meanwhile the Business and Defence Services Administration of the U.S. Government is investigating "more than a score" of recent transactions involving possible illegal use of the priority system for allocating nickel to defence users. These abuses involve false use by producers of priority ratings to fill orders by non-defence users; exaggeration by authorized defence users of the amount of nickel they actually need; and the falsification by non-defence users of priority orders to obtain nickel, which is then sold on the "grey" market. Violators of the Defence Production Act of 1950 face maximum penalties of five years in prison and a \$10,000 fine, or both, if found guilty of falsifying priority orders.

A Brooklyn, N.Y., corporation and two of its officers pleaded guilty in a Federal District Court in New York City to a charge of illegally obtaining 72,000 lb. of nickel salts and selling them in the black market. Last week the two officers received prison sentences of 60 days and were fined \$5,000. The corporation was also fined \$5,000. Further cases are being referred to the Department of Justice as rapidly as investigations can be completed.

About £500,000 has been spent on development at Empress nickel claims near Gatooma, in Southern Rhodesia, reports Barclays Bank D.C.O. The pilot plant is said to have cost some £60,000 and consists of a small crusher, a ball-mill, and 46 flotation cells with their ancillaries. The route for a new 30-mile

tarred surface road from the Empress site to the main Bulawayo-Salisbury road is at present being surveyed.

★

Western Nickel Mines, Ltd., reports an initial production rate of 400 tons of ore daily. Its shares are owned 50 per cent by Newmont Mining Corporation and 40 per cent by Pacific Nickel Mines, Ltd. Reopening of the mine workings near Choate, British Columbia, began in April. Substantial quantities of nickel are contracted for delivery to European buyers in 1958, 1959 and 1960. The nickel-copper concentrate produced will be treated at the Fort Saskatchewan refinery of Sherritt Gordon Mines, Ltd.

UGANDA WOLFRAM

The Uganda Minister of Finance, Mr. C. G. Melmoth, and the president of the Uganda Mining Association, Mr. E. Broadhead-Williams, are to meet officials of the Ministry of Supply in London early this month to discuss the Ministry's five-year contract for supplies of wolfram from Uganda, which is due to expire in September, 1957.

The contract, which started in 1952, guaranteed Uganda wolfram producers a minimum price of £12 10s. a unit and the Ministry of Supply has taken the entire production of wolfram at this level. In view of current world prices, producers in Uganda are concerned at the prospect of their bulk contract being ended. They have undertaken considerable capital development of their mines within recent years, including extensive mechanization, and it has been stated that they would find it hard to meet their costs if the present price was reduced.

★

Wah Chang Corporation has developed a new process to treat tungsten ores at its refining plant at Glen Cove, New York. The new process can produce the finished product directly from the ores in a continuous operation. The tungsten ore is charged into one end of the system and is discharged as pure tungsten crystals at the other end. The method is designed, *inter alia*, to eliminate all objectionable processing wastes as part of the firm's pollution control programme. The plant can treat upwards of 1,000 s. tons of tungsten concentrates monthly.

Wah Chang is spending \$1,000,000 to expand the capacity of its zirconium plant at Albany, Oregon, to 275 s. tons a year from 200 tons. The current \$2,000,000 plant was built in 1956.

IMPORT CONTROLS REMOVED

The President of the Board of Trade, Sir David Eccles, has announced that the U.K. Government has decided to remove the import controls on a large number of commodities used in industry. This

will mainly affect dollar imports. The broad effect will be that the remaining import controls on the basic raw materials of industry and on metal semi-manufactures will be removed on August 1.

From August 1, 1957, the following commodities can be imported from any country under open general licence:

The following alloys of metal unwrought: alloys excluding gold, silver, thorium, and uranium.

Boron minerals, crude, and concentrates of boracite and rasorite.

The following lithium minerals: Amblygonite, lepidolite, lithiophilite, montebrasite, petalite, spodumene, triphylite and zinnwaldite.

Metallic ores, concentrates and residues, other than of silver, thorium, and uranium.

The following metals, excluding alloys, unwrought: antimony, bismuth, calcium, chromium, copper, gallium, germanium, hafnium, indium, iridium, lead, magnesium, osmium, palladium, platinum, potassium, rare earth metals (including scandium, but excluding cerium), rhodium, rhodium, ruthenium, sodium, tin, vanadium, zinc, zirconium.

Metals in the form of powder, except the following metals and alloys thereof: Cerium, gold, silver, thorium, uranium, rutile.

Sand, excluding monazite.

Scrap metals, residues and wastes fit only for the recovery of metals, other than sweepings, residues, refinable bars, lemel, or scrap containing precious metals.

Silicon, silica, and tellurium.

NATIONALIZATION OF MICA ?

The Andhra Government will consider the nationalization of mica mines after the establishment of the proposed State Trading Corporation for Minerals. Speaking in the Andhra Assembly, the Industries Minister, Mr. V. B. Raju, said that the nationalization of mica mines was a venture and involved a great risk. The Assembly passed a Bill incorporating certain amendments relating to the disposal of mica in the possession of a licensee whose licence had been cancelled by the Government. The Bill provides for the introduction of a system of licences to regulate the possession and sale of mica and a system of permits to control its removal and transport. The aim is to check the smuggling of mica.

U.S. SURPLUS VANADIUM

Approximately 4,250,000 lb. of fused vanadium pentoxide is surplus to U.S. Government needs and is available for sale at Grand Junction, Colorado. To avoid significant impact on commercial markets, which might occur should all this material be sold at one time, the

Business and Defence Services Administration was consulted. As a result, the A.E.C. has developed a sales programme whereby approximately 500,000 lb. of contained V_2O_5 will be offered for sale periodically, probably at intervals of four to eight months, depending on market conditions.

*

The Union Carbide Corporation and Vanadium Corporation of America have been found not guilty in the U.S. District Court at Denver of Department of Justice charges of conspiring to monopolize and fix prices in the vanadium industry.

JAPANESE TITANIUM EXPORTS

Japanese titanium manufacturers are reported to be alarmed by the hesitation shown by some U.S. civilian importers to continue imports of Japanese titanium sponge. The hesitation is attributed to the shift of emphasis in the U.S. defence programme to guided missiles, which is believed to have reduced the demand for titanium required for the production of jet aircraft.

Half of the shipments to the U.S. are made under long-term contracts with the Commodity Credit Corporation. The contracts with the C.C.C. are not affected by the change in the defence programme, but those with civilian importers are liable to postponement or even cancellation. Japanese titanium manufacturers

will now have to cultivate the domestic market for titanium by reducing prices of their products.

*

It is reported from Melbourne that Titanium Minerals' production from its Jerusalem Creek plant for the current quarter is running at a maximum of 60 tons of rutile a week, compared with an average of 53 tons weekly for the March quarter. From July 1 output is expected to go up to 75 tons weekly.

Shaw River Alluvials N.L. has announced that arrangements have been made for the field testing of a plant to produce heavy minerals from the company's rutile areas at Kempsey. Test production is expected to begin about the middle of July.

U.S. ANTIMONY PURCHASES

Nearly \$1,000,000 worth of antimony will be purchased by the General Services Administration of the U.S. Government from the Sunshine Mining Co. over an 18-month period starting in July. G.S.A. has contracted to buy 1,500 tons. To produce the grade of metal required, Sunshine claims to have developed a new process for refining the impure cathode antimony which it has been producing in its electrolytic antimony plant. The antimony is a by-product obtained in the production of silver concentrates from the company's ores.

much less, as production is almost certain to be less and consumption to rise, albeit slowly: the imponderable is the tonnage of Russian tin which may enter the Western economy during the year.

LEAD PRICE VULNERABLE

Lead and zinc markets have still a weak undertone, with one American customs smelter having reduced the price of zinc to 10 c. per lb., and although this appears to be the general price, other sellers have not yet conformed officially. It seems that with the present span between the lead and zinc quotations in the United States, a further reduction in the former cannot be avoided very much longer, and it is probably due to the expectation of this event that London prices have tended to give way a little early in the week.

The low price of zinc has begun to have an effect on output and during the week the American Smelting and Refining Co. announced a cut in their production of high-grade zinc of 2,700 s. tons per month, and at the same time they gave notice that they were shutting down three mines and one mill. The low prices also are causing difficulties for management in negotiating new contracts with labour, and at a number of places in the United States strikes have started owing to failure to reach agreement on new terms of employment.

The Belgian smelters are also paralysed by strikes, and most people feel that it is immediately due to this that the zinc quotations in London have been firmer and a backwardation once more established. All these happenings should eventually re-establish a better balance between zinc production and consumption, and enable the price to go up to more economic levels. Production in Belgium during the first quarter of 1957 amounted to 61,509 tonnes as against 5,936 tonnes for the comparable period a year ago.

There has been little action to reduce production of lead, and it is interesting to note that lead production in the O.E.E.C. countries continues to rise, the figure for May being 51,064 tonnes against 47,871 tonnes in April. The same picture is shown by the figures released for the Belgian output of lead for the first quarter of 1957, the production of lead rising from 24,961 tonnes in the first quarter of 1956 to 27,079 tonnes in the first quarter of 1957.

Closing prices and turnovers:

THE WEEK ON THE L.M.E.

	June 27		July 4	
	Buyers	Sellers	Buyers	Sellers
COPPER				
Cash ..	£220½	£220½	£222½	£222½
Three months ..	£221½	£221½	£223	£223½
Settlement ..		£220½		£222½
Week's turnover	5,200 tons		7,325 tons	
LEAD				
Current ½ month	£89½	£89½	£91	£91½
Three months ..	£89½	£90	£91½	£91½
Week's turnover	3,475 tons		3,600 tons	
TIN				
Cash ..	£761	£761½	£764	£766
Three months ..	£758½	£759	£760	£761
Settlement ..		£761½		£766
Week's turnover	1,195 tons		1,160 tons	
ZINC				
Current ½ month	£73½	£73½	£77	£77½
Three months ..	£72½	£72½	£75	£75½
Week's turnover	5,775 tons		7,225 tons	

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

AUTUMN PRICE REVIVAL?

As was said last week, it was then the general opinion that markets would be unable to withstand any lowering of quotations without reacting violently, and over the week-end the reduction by the R.S.T. of their price to £120 per ton and the subsequent American Customs Smelters' reduction in price to 28½ c. caused an immediate reaction in the copper market which, however, was quickly reversed when it was rumoured that the Chilean authorities were contemplating permitting a 10 per cent reduction in output. It is difficult to see how such an action can have any immediate restriction on the flow of metal into the market, as it normally takes at least three months before production cuts make themselves felt, and in the meantime, the excess production must be absorbed somewhere, and it can only be expected that this will be done at lower prices than those ruling today, more especially as Japan, India, and France are having to make sizeable cuts in their import programmes.

Consumption is now beginning to feel the effects of the holiday season and it will be very unwise to look for any sustained recovery in price for some weeks, but there is no doubt that the curtailments in production that have been arranged will have an effect in the autumn and should this coincide with the expected increase in demand, recovery could be of considerable magnitude.

The contango continues to be maintained and stocks in official warehouses went up a further 274 tons last week, bringing the total to over 10,000 tons, which by any calculation is a reasonable basis for dealings on the Exchange, and it would seem that if the increases continue, the contango will have to increase to a figure which is based on the existing return on money available elsewhere.

SMALL TIN SURPLUS

The only feature about the tin market has been its steadiness, which is attributed to operations by the Buffer Stock manager. The stocks in official warehouses rose by 256 tons to 2,266 tons, and the Eastern price on Thursday was equivalent to £773½ c.i.f. Europe.

Tin-in-ore shipments in May from Indonesia are reported at 2,174 tons, which is only slightly in excess of the April figure: it would appear that the tin industry in Indonesia is still functioning satisfactorily and fears that the output would be reduced this year have proved unfounded.

In their latest report, Messrs. Vivian, Younger and Bond, Ltd., examine once again the possible size of the surplus of tin during 1957 and they point out that although the chairman of the International Tin Council still adheres to his estimate of 5,000-7,000 tons, they themselves think that the figure will be very

Mining Finance

Better Outlook for Gold and Base

The return to the list of dividend payers of Gold and Base Metal Mines of Nigeria after a year's absence focuses attention on the improved outlook for this important Nigerian tin and columbite producer.

The company experienced difficulties over the last three years, brought on by its decision to produce columbite to obtain the 100 per cent bonus price available under the D.M.P.A. programme. Although this was very successful—columbite production rose from 30 s.tons in 1952, to approximately 180 s.tons in 1955 and 1956—the benefits accruing went largely to the company rather than to the shareholders. This was so because to "cash in", as it were, on the D.M.P.A. programme, involved the acquisition of additional properties and substantially increased mechanization of operations. In effect, earnings from columbite production during the years 1952 to 1956 were used to finance the company's development and no less than £264,000 was repaid in columbite over the last two years to D.M.P.A. in repayment of its development loan to the company. Unfortunately, the bonus programme came to an end last year before the company could reap any real benefit from its columbite operations.

However when it was known in May, 1955, that one way or another the U.S. stockpile quota had been filled, more attention was then paid to laying the basis for an expansion in tin production. The success of the re-orientation of the company's factors of production was apparent last year when the output of tin rose to 773 l.tons compared with 582 l.tons in the previous year. Columbite production was more or less stabilized, being 178 s.tons in 1956 against 183 s.tons in 1955.

When it is borne in mind that the recent dividend payment can be entirely attributed to tin earnings, the prospects for the current year are very interesting indeed. In the first place, tin production for the first five months of 1957 are running at an average of 80 l.tons per month, equivalent to 960 l.tons in the full year which, if achieved, would be the best performance since 1942 when production was recorded at 1,000 l.tons. This must, of course, be read in conjunction with the outlook for tin. But this is good despite the expectation of a small overall world surplus this year as the potential buying power of the buffer stock should enable prices to be maintained at a level profitable to efficient producers, there are no large stocks overhanging the market either here, on the Continent or in America, tinplate production is being maintained at high levels on both sides of the Atlantic and finally, perhaps, market outlets for tin are slowly but persistently increasing.

In the second place, although the company has deliberately curtailed its columbite output, as is reflected by the figures for the first five months of this year of 35 s. tons compared with 71 s. tons in the comparable period of 1956, Gold and Base has completed its columbite development programme and is now in a sound position to take advantage of any revival of the market.

In this latter connection, Dr. G. L. Miller, writing in *The Times* on Tuesday of this week, has made a valuable contribution to current thinking about the outlook for columbium. After reviewing the overall picture, Dr. Miller pointed to the successful use in the Dounreay fast reactor of columbium as a canning material, as it had been proved the most suitable metal available at the present stage of development. Moreover, columbium is compatible with uranium and is expected to be equally compatible with plutonium.

Research work now taking place in the United States aims at producing columbium alloys capable of operating at 1,200 deg. C., which would mark a considerable advance over the present materials used in aircraft jet engine parts. However, if approved and utilized for this purpose, Dr. Miller said, the introduction of columbium alloys would be delayed

because of the necessity to re-design the engines. In the U.S., he added, the picture is somewhat obscured by over-optimism, but it is generally agreed that there will be two main developments; the first in the nuclear field involving the use of high-purity expensive metal entailing a demand not exceeding 30 tons a year in the U.S., while the second, in the aircraft industry would be for a less pure and less expensive metal, of which 500 tons a year may be wanted in the United States.

Interpreted in this context, the outlook for Gold and Base Metal Mines, and indeed other Nigerian columbite producers, can be regarded as encouraging. Meanwhile, in so far as Gold and Base is concerned, the shares will more than pay for their keep on expanded tin production alone, which should enable the company to return to its 1952 distribution level of 15 per cent—and that could be reached this year.

LONDON MARKET HIGHLIGHTS

During the week, June 25 to July 3, the Kaffir market behaved well with the market leaders F.S. Geduld, rising 4s. 3d. to 78s. 6d. Buying was in anticipation of good June profit figures (since confirmed) and the fact that the June quarterlies will be published within the next fortnight or so has accentuated interest. For precisely the same reasons Western Holdings rose 5s. 7½d. on the week to 73s. 9d. Buffelsfontein moved up 2s. 9d. to 36s. 7½d. in line with the generally better trend but additional stimulus has been provided by the knowledge of the liquidation of a largish line of shares overhanging the market at 35s. Freddie Consolidated were firmer with a 6d. rise to 4s. 3d. on hopes of a profit being announced for the June quarter, a likely event in view of the decrease in losses from gold operations.

Mining finance houses have been active and Johnnies improved its position by 1s. 9d. to 52s. 3d. partly on rumours that American buying had that acquisitive look, but also on belated recognition of the company's strong financial position. Anglo American Corporation have been a good market, rising ½s. to £6½s. The fall in the price of Anglo American shares over the past two months had gone much too far and this, coupled with the fact that the company's O.F.S. mines have been doing particularly well has brought in buyers.

Afrikaner Proprietary Gold Mines, dealt in over here under 163 (1) e, enjoyed an active market, and the 2s. shares have advanced 1s. 9d. to 5s. 7½d. on the week. Further details concerning this company are given elsewhere on these pages.

Strong buying from Paris was responsible for lifting De Beers Deferred Registered 19/32 to £5 19/32. Although demand from this source dried up in the

last few days, recognition that the company is probably as much interested in gold as in diamonds has not been lost on the more discerning investor, and it was most likely this assessment that put the shares up to £5 21/32 earlier this week.

In base metals, Consolidated Zinc fell 1s. 9d. on the week to 69s. 6d. after touching a low for the year of 68s. This stands in sharp contrast to its price of 92s. touched a few months ago. Weakness in these shares stems from the lack of benefits under the Finance Bill, uncertainty as to the future financial requirements to develop its Cape York bauxite deposits, and the fall in the lead and zinc prices.

Coppers, after being a dull and flat market for most of the week, rallied strongly on Wednesday following the announcement of a 10 per cent cutback in production from the Chilean copper mines. With reservations, it is possible to say that producers can control the price of copper within the £220-£260 a ton range, and opinion is hardening that production one way or another will be cut back to equate demand. This will give a firm undertone to the metal price and will provide a sound basis from which producers can step up output as required. Investors would be wise to watch this market closely, as any revival of demand for copper will be on a large scale to meet both demand and depleted inventories. Rhokana, after sinking to as low as £34, and Messina to 133s. 9d., a low for the year in each case, rallied on Wednesday to £35½ and 6½ respectively.

Chartered resisted the trend on hopes that companies incorporated by Royal Charter to develop overseas resources would qualify as overseas trade corporations. This is now under consideration by the government.

AN INTERESTING SPECULATION

Afrikaner Proprietary Gold Mines, incorporated in South Africa as long ago as 1905, has been an active market the last week or so with buying orders coming from both London and the Union.

The company acquired Bush Holdings (Pty.) Ltd. last month for the sum of £75,000 by issuing 750,000 shares of 2s. each thereby increasing the issued capital of Afrikaner Proprietary to £161,285.

The purchase has given the company possession of certain diamond dumps on farm New Elandsfontein 949 in the Boshof district, O.F.S., a completely new washing and treatment plant, etc. Valued by Samuel Osborne (S.A.) Pty. at £50,040 and prospecting options over near and adjoining farms extending some 2,945 morgen.

Excluding the discovery of any specified gems valued from £20 to £100 per carat, a conservative estimate of gross annual working profits has been computed at £46,512, equivalent to nearly 29 per cent of the issued capital. Notwithstanding the obvious possibilities of expanding earnings from this enterprise, interest in the shares has been aroused on its acquisition, on extremely favourable terms, of prospecting options for coal over an area in excess of 10,000 acres in the Wakkerstroom district on which reports have been favourable. Moreover, the area would appear to be scheduled for improved transportation facilities.

The longer term prospects are concerned with the outcome of negotiations now proceeding for the acquisition of interests overseas, and any favourable announcement on this score could have a pronounced beneficial effect on the present share price. The board of directors has recently been reconstituted and policy is wedded to the diversification and expansion of the company's interests.

The shares can be regarded as an interesting speculation.

LONDON MARKET HIGHLIGHTS—NEW "M.J." FEATURE

Beginning this week we are discontinuing the publication of our weekly share price table and in its place we shall publish a weekly market review of which the first is published opposite. We have taken this step after an enquiry among many of our readers had confirmed our own opinion that a table showing weekly share price movements is of little use as, in general, investors require daily quotations.

We believe this new feature, which will highlight the principal share price movements of the week against the background of the principal factors influencing the market, will give the reader a useful picture of market highlights and point to probable market trends.

MUFULIRA EXPANSION

In his statement to members of Rhodesian Selection Trust last November, Sir Ronald Prain disclosed that the potential of Mufulira might be 50 per cent higher than had been anticipated. The additional ore to make this possible had been discovered to the west of the existing mine, and, Sir Ronald continued, the development of "Mufulira West" would make the mine the third largest underground

copper producer in the world. It would seem that these expectations have now been confirmed in view of the announcement this week by Philip Hill, Higginson and N. M. Rothschild. Subject to Treasury consent, £7,000,000 of 6½ per cent loan stock 1967/82 is to be placed at £98, in order to finance the expansion scheme to increase the company's capital from 100,000 to 155,000 tons a year. Calls are to be spread over three years, a period presumably relating to the cash needs of the expansion schedule.

RAND MINES' STRONG INVESTMENT POSITION

Mr. W. M. Frames, at the annual meeting of Rand Mines held in Johannesburg at the end of last month, said that no less than 84 per cent of the company's mining investments were in mines with estimated lives of at least twenty years, and that decreasing dividends from older mines could probably be offset by the increased distributions from newer mines.

To serve the interests of both the government and the shareholders Mr. Frames stated that steps beyond the control of mining companies would be necessary to increase the profitability and lives of gold mines on a marginal profit basis.

Some slackening in the tempo of the Union's economic expansion and a falling away of the influx of capital had been noted but development was proceeding apace and there are no basic economic reasons for anticipating a general recession. In fact, Mr. Frames said, with the government now encouraging industrial development there were likely to be opportunities for further investment.

NARAGUTA EXTENDED DOUBLES DIVIDEND PAYMENT

A preliminary profit statement from Naraguta Extended Areas in respect of

operations for the year 1956, shows that tin ore production last year advanced to 195 tons compared with 109 tons in the preceding year. Working profit for the year, after charging depreciation, soared to £15,739 compared with £4,866 and, even after providing £9,500 against £1,625 for taxation, net profits were virtually doubled at £6,239 compared with £3,241 in the preceding year.

A final dividend of 5 per cent is recommended making, with the interim of 5 per cent already paid at the end of January last, 10 per cent for the year which goes against 5 per cent for 1955. The total distribution absorbed £5,960 leaving the carry forward at £1,720 compared with £1,734 brought in. Meeting, London, July 31.

WHAT'S WHAT ON THE COPPERBELT

The Northern Rhodesia Chamber of Mines has now released its Year Book for 1956. The 126 pages contained between the hardboard covers is packed with all manner of relevant statistical data essential for the understanding of the Northern Rhodesia copper mining industry. There are, too, succinctly written chapters on legislation, production, employees, the Chamber, training and education, accidents, first aid and rescue activities, and coal and power. These topics form the first part of the Year Book with the second section being composed of statistical tables. The third and last section contains information on each company in the Copperbelt and the whole provides a useful overall picture.

The 1956 edition is the first to be made available to the public in its new form and the wealth of information it contains should have a wide appeal. Those interested in the Year Book should write to the Northern Rhodesia Chamber of Mines, P.O. Box 134, Kitwe, Northern Rhodesia.

FINANCIAL NEWS AND RESULTS IN BRIEF

New Kleinfontein Pass Dividend.—In view of the losses which have been sustained in past months, it is hardly surprising that the New Kleinfontein Company are to pay no dividend in respect of the first six months of 1957. The June return is more promising, however, showing a profit of £509 against a loss of £3,880 in May. Only about £250 of the improvement is directly attributable to the higher value placed on gold. Costs, already among the lowest on the Rand, also improved by 1d. per ton to 29s. 8d., while the grade was lifted from 2.29 dwt. to 2.36.

Indian Copper Corporation.—A final dividend of 13½ per cent makes a total of 20 per cent for Indian Copper Corporation on the increased capital. a 33 per cent decrease on the 1956 equivalent of 30 per cent (including a bonus equivalent to 16½). After providing for depreciation of £175,000 (same) and a transfer to general reserve of £175,000 (£200,000), taxation took £885,027 against £683,046, and the net profit fell to £272,157 from last year's £416,758.

Faraday Uranium.—In the course of his remarks to members of Faraday Uranium Mines Ltd., Mr. A. W. Johnston, the

president, pointed out that although present mill grade is running slightly below 0.10 per cent uranium oxide, the ultimate recovery should settle down at about 0.115 per cent. In May, 31,884 tons were milled for a working profit of \$264,670.

Bateman Bay Gets That Sinking Feeling.—A news release from the Bateman Bay Mining Company discloses that the company is to undertake a shaft-sinking and development programme in the Chibougamau area of Quebec. Results ranging between 1.76 and 4.47 per cent copper, 0.046 and 0.084 oz. gold, and 0.15 and 0.83 oz. silver were obtained in the various ore zones during the past year's \$600,000 drilling programme. The operations, to be directed by Continental Mining and Exploration, are estimated to cost \$500,000, which will be met from funds on hand or potentially available to the company.

Welgedacht's June Sales.—An E.G.M. has confirmed the deed of sale between Welgedacht Exploration and Ruven Ltd., in respect of a portion of the farm Welgedacht No. 2 and certain improvements thereon.

CONSOLIDATED GOLD FIELDS OF SOUTH AFRICA

CAPITAL INCREASED

An extraordinary general meeting of the Consolidated Gold Fields of South Africa, Ltd., was held on June 28 in London to consider a resolution to increase the authorized capital from £8,000,000 to £11,000,000.

Mr. Robert Annan, chairman, in the course of his speech, said: When last I addressed you at the Annual General Meeting on December 13, 1956, I referred to our policy of expansion and exploration. I also referred to our intention to broaden the scope and basis of our business.

We therefore propose, subject to your passing the resolution to be put to this meeting, to create and issue £1,958,404 of 6 per cent Convertible Unsecured Loan Stock, 1977-82, and at the same time to issue 979,202 Ordinary shares of £1 each.

This issue, which has been underwritten, will provide some £3,780,000 and will be made in the following way. There will be offered as a right to the Ordinary shareholders of the Company one combined unit of £2 Loan Stock at par and

one Ordinary share at 40s. for each five Ordinary shares now held.

Terms of Issue

The price of £4 for the combined unit will be payable as to £1 on or before July 16, 1957, and £3 on or before August 27, 1957, each instalment being applied in equal parts to the payment of the Loan Stock and the Ordinary shares. The provisional allotment letters will be renounceable while they are "Nil Paid". Against the partly paid provisional allotment letters separate renounceable allotment letters will be issued in respect of the Loan Stock and the Ordinary shares comprised in the combined units. Shareholders will also receive a "pink form" upon which they can make application for excess combined units.

The Loan Stock will be convertible up to December 31, 1961, at the following rates for each £100 of Stock. In the calendar year 1958, 40 Ordinary shares approximately equal to 50s. per share; 1959, 39 Ordinary shares approximately

equal to 51s. 3d. per share; 1960, 37 Ordinary shares approximately equal to 54s. per share; 1961, 35 Ordinary shares approximately equal to 57s. 1½d. per share. Of the 3,000,000 new Ordinary shares to be created, 979,202 will be offered in the proposed issue and 783,362 will be reserved to meet conversion rights of the Loan Stock.

The Ordinary shares forming part of the issue will rank for all dividends hereafter declared on the Ordinary capital of the Company. Ordinary shares arising from conversions between June 1 and 30 or September 16 and December 31 in any year will not rank for dividend until the next following July 1 or January 1, as the case may be.

We expect that the growth in the Company's revenue which has taken place in the past few years will continue into the future. In the absence of any unforeseen circumstances, we expect to recommend a final dividend of 3s. per share less tax on the Ordinary capital as increased by the proposed issue, and we look to a vigorous policy of development to improve our position still further in the future.

The resolution was carried.

RAND MINES, LIMITED

(Incorporated in the Union of South Africa)

MR. W. M. FRAMES'S STATEMENT

In the course of his address to the Ordinary General Meeting held in Johannesburg on June 20, 1957, Mr. W. M. Frames made the following remarks:

Due to an increase in the dividends received from investments and to a reduction in net administration expenses, the profit for the year was £98,000 greater than for the previous year. However, a general decline of prices on the Stock Exchange and the policy of adjusting the book value of investments to the lower of cost less amounts written off or Stock Exchange valuation or, in the case of unquoted shares, the Directors' valuation, necessitated the writing down of investments by £445,000. To meet this depreciation £98,000 was obtained from profits on the sale of investments and property, £247,000 was transferred from investment reserve, and £100,000 was taken from profits for the year. This latter charge was the main reason for the net profit figure recorded in the Profit and Loss Account being slightly lower than that for the previous year.

It is common knowledge that overseas selling of South African securities, particularly gold shares, which comprise no less than 62.5 per cent of your company's investments, was in the main responsible for the continued decline in 1956 in Stock Exchange values. Whatever the reason for this selling, it is evident that it is not based on the current returns of the shares. This is illustrated by the fact that, after allowing for additional investment during the year of nearly £400,000, the market value of the company's quoted investments fell by 11 per cent, whereas the income from those investments rose by as much as 12 per cent.

Although the gold mining industry and the older mines in particular face many problems, the general outlook for the industry is favourable. There were substantial increases in revenue and pro-

fit in 1956 and further increases in both gold and uranium output are likely in the next few years. Your company's investments are so planned that, other things being equal, any decrease in dividends from the older mines will probably be offset by increased returns from its holdings in the newer mines. In this connection, you will be interested to know that, including collieries and based on market valuation at the end of 1956, no less than 84 per cent of your company's mining investments was in mines with estimated lives of at least twenty years. It is, however, my duty to draw attention to the difficulties faced by many of the old mines, which are on a marginal profit basis. These mines, several of which are members of the Central Mining—Rand Mines Group, produce an important percentage of the total gold output which provides the country with valuable foreign exchange, yet some of them are unable to make worthwhile distributions to shareholders. In these cases it would be in the best interests of shareholders for such companies to cease mining operations, realize their assets, and distribute the proceeds. It has been suggested, however, that such action would not be in the best interests of the State, not only because of the local economic dislocation it would cause but also because of the resultant loss, probably for all time, of the gold ore remaining in those mines. In order, therefore, that the interests of both the State and the shareholders might be served, steps beyond the control of the mining companies would be necessary to increase both the profitability and lives of the mines concerned.

Coal and Industrial Interests

Against a background of a decreasing rate of economic expansion in the Union of South Africa, the operating and financial results for the year of the coal, industrial and other companies in which

Rand Mines, Ltd., has interests, were satisfactory.

In general, colliery companies earned increased profits due to the higher coal price allowed towards the end of 1955. The industry continued, however, to be handicapped by transport difficulties and was unable to meet the inland demand in full. There was also evidence of a non-European labour shortage, which is being countered in some cases by increased mechanisation. The industry is sparing no effort to increase its output to meet the expanding inland demand and also to recapture the former valuable export business if and when there is the necessary improvement in the transport position. It should, however, be borne in mind that increased mechanisation requires heavy capital expenditure and the return on the capital employed in collieries will tend to decrease unless there is a compensating increase in the price of coal.

The Transvaal Consolidated Land Co. increased its dividend by 6d. to 3s. per share for the year and also increased its investments in shares. It provided the major portion of the share capital required to open up the new Winterveld Chrome Mine, which is now operating successfully. The South African Forest Investment Co. again increased both its sales and the area planted to trees.

Increase in Capital

As with the investment in the gold mining industry, your Board has every confidence in the future of its coal, industrial and other investments. It is the intention to follow up and increase these investments whenever favourable opportunities occur and to intensify the search for new business. Although there has been some slackening in the tempo of economic expansion and a falling off in the inflow of foreign capital, there are indications of continued development and no basic economic reasons for anticipating a general recession. With the Government now encouraging industrial development, there are likely to be opportunities for further investment, and I would draw your attention to the special business of the meeting. Your Directors wish to be in a position to take imme-

diate advantage of opportunities of improving and expanding the company's investments and therefore recommend that the authorized capital be increased from £550,000 to £850,000, and that they be authorized to issue part or all of the shares then held in reserve at such times, to such persons, and on such terms as they may determine. Subject to the passing of the necessary resolution and to the consent of the United Kingdom Capital Issues Committee being obtained, your Board intends, as you will have seen from the announcement made in the Press last Tuesday, to make an early issue of 700,000 of the reserve shares. Shareholders will be offered 215,099 of these shares at a price of 63s. 6d. per share, which is below the market price. The remaining 484,901 shares will be issued to Central Mining Finance, Ltd., and the Consortium which has acquired a large interest in the Central Mining and Investment Corporation, Ltd., at 69s. 6d. per share, which is 6s. above the price of the shares offered to shareholders. The issue will provide funds to enable the company to take advantage of investment opportunities. The balance of the new shares will be held in reserve. Your Directors also recommend that the maximum number of Directors permitted in terms of the Articles of Association should be increased from eight to twelve in order that representation on the Board may be widened.

In the absence of the quorum necessary to consider the Special Business, the meeting was adjourned for one week.

At the adjourned Meeting, the Special and Ordinary Resolutions were passed unanimously.

TRIEFUS & COMPANY

A VERY ACTIVE YEAR

The Tenth Annual General Meeting of Triefus & Company Limited was held on June 28 in London, Mr. Albert Triefus, chairman, presiding. The following are extracts from his circulated statement:

Consolidated profits show a net profit of £180,220, as against £76,363 for 1955. Group reserves including undistributed profits increased by over £58,000 and now stand at £231,642. Directors recommend total dividend on Preferred Ordinary shares at rate of 25 per cent per annum and dividend on Ordinary shares at rate of 13 per cent per annum.

Last year an active demand for industrial diamonds by engineering and mining users coincided with the absorption of surplus stocks by the United States Government. The New York demand decreased at the end of the year.

The company's sales benefited from these influences, but our policy of maintaining regular supplies to consumers protected us from the full effects of these fluctuations. It would, however, be unrealistic to assume that the 1956 level of profits can necessarily be maintained.

Work on the development of tools and their application in industry has been continued. Our manufacturing company, Triefus Industries, Ltd., is settling down in its new works at Crawley, the extension of which was completed last year.

There was a good demand for rough and polished gem stones throughout the year.

A test case brought in our name against the Post Office related to a parcel of diamonds lost in the post. Our insurers paid the claim and legal costs.

The report and accounts were adopted.

SIAMESE TIN SYNDICATE RECORD PRODUCTION

The fiftieth annual general meeting of the Siamese Tin Syndicate, Ltd., was held on June 27 in London, Mr. Robert S. G. Scott, chairman, presiding.

The following is an extract from his circulated statement for 1956:

The production of the group for the year was the record figure of 3,656 tons of tin concentrates, a substantial increase over last year's total. Mining costs have been slightly reduced on average, though as you will see from the statistics accompanying the accounts there have been some fairly marked changes on individual properties, due to variations in yardages dug and value of ground worked. The incidence of export duty has, however, increased appreciably and the final result is a small overall increase in costs. On the other hand, the average price obtained for our product was higher at £758 per ton metal.

As a result of the increased production and higher price, our profits have increased considerably and the consolidated net profit for the year before taxation is £770,714 compared with last year's figure of £491,344. The amount set aside for taxation totals no less than £445,809, and after making provision for the special items shown, we are left with a net profit after tax of £274,471. There has been retained in the various subsidiary companies, by addition to reserves and amounts carried forward, a total of £87,918. With the sum of £31,364 brought forward there is thus available to the parent company £217,917. Out of this, interim dividends costing £102,109 have already been paid, and the Board now recommends a final dividend of 27½ per cent (making 60 per cent for the year) which will cost £86,399, leaving an amount of £29,409 to be carried forward.

The Outlook

Last year I told you I was no pessimist in regard to the future of tin. It is still my belief that in spite of the probability of a surplus of production for the next year or so, the position thereafter might change very rapidly. World consumption of tin has shown a significant increase over the last few years in spite of the substitution of electrolytic tinning for hot dipping in tinsplate manufacture. It may well be also, that increasing use will be found for the new organotin compounds already being used extensively as stabilisers in plastic manufacture.

In the light of these remarks you will readily understand your Board's concern at our continued lack of success in finding any substantial fresh reserves of tin in South Thailand and the Malayan Peninsula. It is imperative in our view, therefore, to look to other sources, and for that reason we have, during the past year, considerably broadened the basis of our search. A property in Western Australia was examined, but proved unattractive. Arrangements were also made with associates for a preliminary examination of the tin finds reported in Peru.

Meanwhile an opportunity presented itself of obtaining a stake in the promising mining developments in Australia and we are accordingly participating on a small scale with the Rio Tinto Company and Le Nickel S.A., in an extensive exploration programme over a large area in Western Queensland.

The report and accounts were adopted.

BISICHI TIN (NIGERIA)

The forty-sixth annual general meeting of Bisichi Tin Co. (Nigeria), Ltd., was held on June 27 in London.

Mr. W. J. C. Richards, Chairman, presided and the following is an extract from his Statement circulated with the Report and Accounts for the year ended December 31, 1956:

Seven hundred and ninety-six tons of Tin and 280 tons of Columbite were produced, and 49 tons of Tin and 10 tons of Columbite were recovered from ore which was set aside for further treatment.

Increased production increased the revenue by £53,000 over the previous year. Larger output and the improvement in mineral recovery in the paddocks and in the dressing plant brought about a decrease of £75 per ton, or 22 per cent, in the cost of production, an achievement which is highly creditable to the General Manager and his staff.

We have paid for the purchase and equipment of the Gombar property, we have paid our first contribution to the Tin Buffer Pool, and we have paid in cash part of the consideration for Naraguta Tin Mines, Ltd. All this has been achieved without asking shareholders for money or availing ourselves of the facilities which our Bankers are willing to grant.

Although prospects for the current year are satisfactory, last year's results are not likely to be repeated.

In the present year we expect to have to pay a smaller proportion of our profits in taxation, as this Company will qualify under the provisions of the recent Finance Bill as an overseas Trading Corporation.

The report and accounts were adopted.

EX-LANDS NIGERIA

The forty-fifth annual general meeting of the Ex-Lands Nigeria, Ltd., was held on June 27 in London.

Major-General W. W. Richards, C.B.E., M.C., Chairman, presided and the following is an extract from his Statement circulated with the Report and Accounts for the year ended December 31, 1956:

The operating items as shown in the Profit and Loss Account are generally similar to last year. Sale proceeds of tin is about the same, although 46 tons more than the previous year is included and the average price realized was £775 per ton against £762 in the previous year. This apparent anomaly arises from a change in the method of valuing tin stocks at the end of the year. Hitherto they have been valued at current selling prices, which anticipates sales at a profit, but this year they have been valued at cost and will be so valued in future. Due to wage increases, etc., mining costs rose by £4 per ton to £275 per ton.

During the year we paid £29,216 to the Buffer Pool established under the Tin Regulation Scheme, and we are liable to make a further contribution. Our cash position must therefore be safeguarded and we again recommend a dividend of 15 per cent, less tax, which is the same as last year.

During the year the price of Tin has fluctuated between £733 and £835. If the price of Tin remains at approximately the level of last year, and we are not disturbed by demands for higher wages, our results for the current year should be satisfactory.

The report and accounts were adopted.

WESTERN SELECTION

The twenty-seventh annual general meeting of Western Selection and Development Co., Ltd., was held on July 1 in London.

Major-General W. W. Richards, C.B., C.B.E., M.C., Chairman, presiding, said: Mr. C. J. Burns, my co-director, has recently returned from a visit to Canada. I have asked him to bring Members up to date on the progress of our affairs in that country.

Mr. C. J. Burns, addressing the meeting said: The Chairman's Review has set out in detail the areas in which your Company's Canadian subsidiary, Anglo-Barrington Mines, Ltd., is at present working. Up to April 30, 1957, your Company had expended in Canada \$784,000 and future development obviously required considerable sums in addition. For this reason it was decided that Anglo-Barrington Mines, Ltd., should promote certain of the various projects as separate companies, obtain approval for trading from the Ontario Securities Commission and make issues in Canada to provide additional working capital to carry through a further stage of development. To date, three mining companies have been registered by your subsidiary and their stock approved for trading by the Ontario Securities Commission. They are Genrico Nickel Mines, Ltd., covering the Tow Lake copper-nickel property, Cordoba Mines, Ltd., owning the Red Lake gold-copper property, and Parks Brook Mines, Ltd., which controls the New Brunswick

claims, situated in an area of major sulphide deposits.

Arrangements for the initial financing of \$150,000 for each Company have been made which will be sufficient according to our technical advisers to carry out the field work recommended as the next stage on each property. Arrangements have also been made for provision of further funds as required to bring each property to the stage where further finance will be readily forthcoming to place the property on an operating basis should development be successful.

The report and accounts were adopted.

MALAYA. Qualified Mining Engineers required for group of Tin Mining Companies. Salary according to age and experience ranging from £1,200 to £1,500 p.a. Provident fund and non-contributory pension scheme. Three years' contracts with six months' home leave on full pay. Excellent prospects for suitable men. Write giving full particulars of age, education, training and experience and marital status to Box 321, Walter Skinner, Ltd., 20 Cophall Avenue, London, E.C.2.

Company Events

A Perkins P6 diesel engine has been kept in continual operation for 19 months on a Canadian drilling project. It worked 12,000 hours and supplied power for 20,000 ft. of drilling with size "A" rods. At the end of that time, we are informed, it was still in such good condition that it could have been kept on the job for another six months without overhaul. The engine, developing 74 b.h.p. at 2,400 r.p.m., was an industrial version of the P6 and was installed in a Boyle Brothers BBS2 drilling rig. It was operating at Sudbury, Ontario. Over 500 drilling rigs in various parts of Canada are now powered by Perkins diesel engines.

*

A universal export service is offered by the Dohm Group Ltd., whose 14 factories

in the U.K. manufacture and export a very wide range of products. The aim is to speed up the flow of traffic in the world markets and to provide manufacturers in every country with an international buyers' index and a mobile team of specialists to solve export problems. The headquarters for the plan is at the group's offices, Victoria St., London, S.W.

Durham Raw Materials Ltd., the U.K. distributors of Du Pont Neoprene and "Hypalon" synthetic rubbers, have opened a new technical service laboratory at Camberley. Research will be carried out primarily, but not exclusively, into the properties and applications of the Du Pont products. Its facilities will be freely available to firms wishing to assess the advantages of this group of products.

MAP OF THE KLERKSDORP FIELD

★ While a mine is at the development stage, it is of vital importance to have a visual picture of its position in relation to the field as a whole. Otherwise the quarterly results published by the companies lose much of their significance.

★ Results reported from adjacent mines often have a direct bearing on the one in which you are interested, which, however, can only become apparent if you have clearly in mind the position of all the properties in relation to one another.

★ The Technical Map Service, located in Johannesburg, performs this service most effectively, for the Klerksdorp field. This map and its accompanying statistical handbook show:—

- the exact position of each mine on the field
- where in each property boreholes have been or are being sunk, how far they have gone and what the core recovery has been on reef intersection
- what shafts are being sunk, how far they have gone and what the final depth is expected to be.

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HALKYN DISTRICT UNITED MINES

The twenty-ninth annual general meeting of Halkyn District United Mines Ltd., was held on July 3 in London.

Mr. R. W. Bankes, C.B.E. (chairman), presided.

The following details of operations during 1956 are taken from the directors' report as submitted to the meeting and the statement by the chairman.

During the year 34,716 tons of ore were milled, the highest annual throughput since operations were re-started after the war, but the average grade was appreciably lower than in recent years. Production of lead concentrates at 2,748 tons remained at virtually the same level as in 1955 and production of zinc concentrates was lower at 454 tons.

The main cross-cut south was extended 964 feet during 1956 but did not intersect any fissure worthy of investigation.

Although more labour was available for development work than in 1955, there was a lack of favourable development prospects. Many development headings were non-productive for considerable periods and much of the material sent to the mill from this source was of a marginal grade which adversely affected the overall average value of mill feed. Development work accounted in all for only 20.2 per cent. of the year's production, a much lower percentage than in previous years.

Production from stopping operations was divided as follows: 21.6 per cent. of total production from the northern lodes, 687 and 674, and 58.2 per cent. from various lodes farther to the south. The contribution which the two northern lodes continue to make is the more useful since it consists of clean free break-

ing ore which facilitates the passage through the crushing section of the mill of some of the wet clayey material from the southern section of the mine.

Lode development during 1956 gave disappointing results and no new lode was cut. In consequence there was a further reduction in calculated ore reserves which nevertheless remain sufficient to provide mill feed at the current rate of throughput for some three years ahead.

Full opportunity was taken of the comparatively dry conditions during the first half of the year to clear the "grip" and repair the track in the main tunnel. Considerable lengths of the track were re-ballasted and nearly 4,000 feet was relaid with new rails.

The value of the work on the "grip" was evidenced during the latter part of the year when it proved possible, apart from one day's stoppage, to continue normal operations underground under exceptional flood conditions which, but for the "grip" clearing, would have resulted in far worse dislocation. Rainfall during the last six months of 1956 amounted to no less than 27 inches, which is only about 5 inches less than the average rainfall over a full year.

The accounts show a profit for 1956 carried to appropriation account of £45,300 (£65,426). After provision of £15,968 (£22,278) net for taxation and £15,834 (£11,602) for writing down capital assets, the available balance, including £46,758 brought forward from the previous account, is £60,256. The balance carried forward after deducting £13,797 for a dividend of 7d. per unit of stock is £46,459.

The chairman concluded his statement with an expression of appreciation of the loyal and efficient service which the company continues to receive from Mr. G. W. Craddock, the General Manager at Halkyn, and his assistants and from the secretarial and accounting staff at London Office.

The report and accounts were adopted.

Rand and O.F.S. Returns for June

Company	June 1957			Year ends	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz.)	Profit (£000)		Tons (000)	Yield (oz.)	Profit (£000)	Tons (000)	Yield (oz.)	Profit (£000)
Goldfields										
Doomfontein a.....	84	34,356	180-0	J	932	375,075	1832-8	664	266,634	1055-9
Libanon.....	103	23,102	56-0	J	1,185	265,833	661-5	1,177	256,971	663-8
Luipards Vlei b.....	79	13,901	5-3	J	971	173,963	114-8	—	—	—
Rietfontein.....	24	5,623	16-3	D	147	33,912	96-6	156	35,353	109-5
Robinson.....	78	16,208	13-7	D	447	90,768	51-1	466	96,579	9-1
Simmer & Jack.....	98	18,174	19-3	D	571	105,530	109-7	610	105,897	93-6
Sub Nigel.....	66	16,758	25-9	J	793	217,348	492-1	796	247,185	890-3
Venterspost.....	126	29,799	64-9	J	1,497	345,335	787-1	1,456	344,661	883-1
Vlakfontein.....	51	18,108	86-5	D	296	105,935	510-0	248	90,248	445-1
Vogels a.....	97	22,567	106-4	D	593	137,943	398-4	603	152,439	540-4
West Drie a.....	75	71,626	392-0	J	900	847,850	6980-3	852	714,690	5724-5
Anglo American										
Brakpan.....	105	17,951	9-2	D	636	108,592	67-3	637	108,769	86-9
Daggas a.....	237	51,611	282-8	D	1,360	299,776	1639-2	1,294	294,084	1659-4
E. Daggas.....	97	16,054	37-6	D	570	94,123	206-4	573	94,360	213-9
F.S. Geduld a c.....	60	40,011	266-4	S	458	524,852	1338-2	221	78,027	205-6
Lorraine a.....	65	12,940	L5-4	S	561	108,679	L58-3	398	66,904	L228-3
President Brand a.....	67	50,367	412-5	S	557	425,300	3492-5	476	377,163	3099-5
President Steyn a.....	96	35,806	198-1	S	810	313,024	1784-8	769	283,908	1602-0
S.A. Lands.....	95	19,909	68-5	D	537	116,257	397-9	528	106,518	324-1
Springs.....	126	13,595	5-7	D	759	82,254	34-0	754	92,058	67-5
Vaal Reef a d.....	62	27,208	161-6	D	349	152,115	894-3	93	31,532	127-5
Welkom a.....	88	22,954	53-5	S	776	196,601	435-4	750	161,831	243-8
Western Holdings.....	102	49,124	355-1	S	836	384,807	2537-3	682	267,449	1593-7
West Reef Ex. a.....	124	27,094	67-3	D	733	158,457	383-1	710	141,997	271-0
Central Mining										
Blyvoor a.....	103	60,513	434-5	J	1,264	718,409	2212-0	1,267	713,308	6172-8
City Deep.....	147	29,320	13-0	D	880	174,344	105-3	888	172,995	15-8
Cons. M.R.....	173	23,065	8-6	J	2,000	276,539	106-6	2,035	286,517	166-5
Crown.....	232	33,818	3-2	D	1,437	210,081	L17-1	1,720	271,193	185-7
D. Roodepoort.....	183	32,039	51-2	D	1,098	192,550	310-0	1,081	186,408	304-7
E. Rand Prop.....	222	57,253	162-9	J	1,285	335,226	737-3	1,250	323,958	1049-3
Harmony a.....	82	32,392	169-0	J	946	340,742	1912-9	1,097	344,579	1776-2
Modder East.....	140	14,074	4-0	J	1,571	171,811	28-5	1,577	165,618	79-1
Rose Deep.....	51	7,467	0-5	D	297	45,511	1-7	264	43,161	7-6
J.C.I.*										
E. Champ d'Or a.....	12	331	L28-1	D	72	2,021	L157-3	89	5,984	L191-4
Freddies Cons. a.....	56	16,254	L11-0	D	340	87,221	L130-2	369	72,204	L257-3
Govt. G.M.A. a.....	88	15,094	1-0	D	716	118,301	L66-1	1,469	180,998	16-6
Randfontein b.....	70	11,841	0-6	D	461	77,540	75-3	—	—	—
Union										
East Geduld.....	135	41,523	294-7	D	824	253,585	1784-2	855	264,193	1877-9
Geduld Prop.....	96	15,256	23-8	D	613	97,134	156-8	631	94,907	205-1
Grootvlei.....	190	40,661	212-7	D	1,157	247,527	1297-8	1,159	250,102	1359-7
Marievale.....	69	18,117	81-3	D	423	111,166	498-0	423	110,995	311-1
St. Helena.....	113	33,057	181-3	D	692	201,912	1109-8	606	178,723	960-1
Van Dyk.....	75	13,551	13-8	D	463	78,190	33-7	480	77,993	9-5
General Mining										
Buifelsfontein a c.....	110	36,136	172-3	J	577	173,661	699-6	—	—	—
Ellatton a.....	33	7,118	23-1	D	195	41,547	90-5	190	45,259	191-4
S. Roodepoort.....	28	6,568	23-9	J	346	80,820	284-7	332	75,870	271-3
Stillfontein a.....	102	46,368	301-0	D	580	251,956	1581-5	528	207,337	1222-5
W. Rand Cons. b.....	148	22,994	23-8	D	863	125,797	99-2	—	—	—
Anglo-Transvaal										
Hartebeestfontein a.....	85	46,325	310-8	J	1015	473,403	2958-7	652	293,470	1529-4
N. Klerksdorp a.....	10	1,242	L5-5	D	62	7,478	L31-4	64	7,459	L18-7
Rand Leases.....	174	27,492	10-2	J	1,939	302,991	L143-8	2,141	330,037	250-5
Village M.R.....	33	5,635	6-0	J	395	64,039	96-3	428	60,497	111-2
Virginia O.F.S. a.....	101	27,169	73-8	J	1,126	267,917	742-4	891	194,785	362-2
Others										
N. Kleinfontein.....	98	11,583	0-5	D	587	67,931	L47-1	630	74,357	15-0
Wit Nigel.....	18	4,002	8-0	J	216	43,885	93-0	220	45,707	91-6

Gold has been valued at 250/2d. (May 249/9d.) per oz. fine. L indicates loss. †Working Profit. *Working Profit includes sundry revenue. a Excluding revenue from Uranium, Acid and Pyrite. b Gold Division only. c Production began January 1956. d Production began May 1956. e Production began January 1957. Operations at Merriespruit remain suspended.

Rand and O.F.S. Returns for June

Assisted by the increase in the gold price basis to 250s. 2d. per oz. against 249s. 9d. in the month of May, the Rand and O.F.S. returns for June showed several good profit increases.

Current favourites in the market all did well with F. S. Geduld, the leader, displaying convincing evidence that it is now getting into its stride by expanding its tonnage throughput, reducing its working costs, and raising its working profit by as much as £56,000 over that achieved in May, which itself represented an advance of £40,000 on the April figures. Grade of ore milled at F.S.G. again rose a full dwt. to 13.3 dwts. per ton. Western Holdings increased its working profits by £40,000 and its grade from 9.2 dwts. to 9.6 dwts. per ton.

The return from Hartebeestfontein was excellent, as was that from West Drie, which continues to lead the field with record profits for the month of £617,000. Grade of ore milled at Drie was unchanged from May at 19.1 dwts. per ton—the highest in South Africa.

LONDON METAL AND ORE PRICES, JULY 4, 1957

METAL PRICES

Aluminium, 99.5%, £197 per ton
Antimony —
English (99%) delivered, 10 cwt. and over £210 per ton
Crude (70%) £200 per ton
Ore (60%) bases 23s. 6d./24s. 6d. nom. per unit, c.i.f.
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 12s. 0d. lb.
Cerium (99% nett), £13 18s. lb. delivered U.K.
Chromium, Cr. 99% 7s. 2d. lb.
Cobalt, 16s. 19s. lb.
Germanium, 99.99%, Ge. kilo lots 3s. 4d. per gram
Gold, 250s. 8/4d.
Iridium, £27/29 oz. nom.
Lanthanum (98/99%) 15s. per gram
Manganese Metal (96%-98%) £310
Magnesium, 2s. 5/4d. lb.
Nickel, 99.5% (home trade) £600 per ton
Osmium, £20/22 oz. nom.
Osmiridium, nom.
Palladium, £7 10s./£8 0s. oz.
Platinum U.K. and Empire Refined £32 oz.
Imported £32 nom.
Quicksilver, £90 ex-warehouse
Rhodium, £42 oz.
Ruthenium, £15/£17 oz. nom.
Selenium, 7s. nom. per lb.
Silver, 78/4d. f. oz. spot and 78d. f.d.
Tellurium, 15s./16s. lb.

ORES AND OXIDES

Bismuth	65% 8s. 6d. lb. c.i.f.
	20% 3s. 3d. lb. c.i.f.
Chrome Ore—	
Rhodesian Metallurgical (semifriable) 48%	£17 8s. 0d. per ton c.i.f.
.. Hard Lumpy (45%)	£17 8s. 0d. per ton c.i.f.
.. Refractory 40%	£12 15s. 0d. per ton c.i.f.
.. Smalls 42%	£16 5s. 0d. per ton c.i.f.
Baluchistan 48%	£12 0s. 0d. per ton f.o.b.
Columbite, 65% combined oxides, high grade	185s./197s. 6d. per unit
Fluorspar—	
Acid Grade, Flotated Material	£22 13s. 3d. per ton ex. works
Metallurgical (75/80% Ca F ₂)	156s. 0d. ex. works
Lithium Ore—	
Petalite min. 34% Li ₂ O	40s./50s. per unit f.o.b. Beira
Lepidolite min. 34% Li ₂ O	40s./50s. per unit f.o.b. Beira
Amblygonite basis 7% Li ₂ O	£26 5s. per ton f.o.b. Beira
Magnesite, ground calcined	£28 0s./£30 0s. d/d
Magnesite Raw (ground)	£21 0s./£22 0s. d/d
Molybdenite (85% basis)	8s. 5d. nom. per lb. (f.o.b.)
Titanium Ore —	
Rutile 95/97% TiO ₂ (prompt delivery)	£57/£59 per ton c.i.f. Aust'n
Ilmenite 52/54% TiO ₂	£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)	120s./125s. per unit c.i.f.
Manganese Ore Indian	
Europe (46%-48%) basis 130s. freight plus 5% surcharge	131d./133d. per unit c.i.f.
Manganese Ore (43%-45%)	106d./108d. per unit c.i.f.
Manganese Ore (38%-40%)	100d./102d. per unit.
	(including duty)
Vanadium —	
Fused oxide 90-95% V ₂ O ₅	£124-£134 per unit c.i.f.
Zircon Sand (Australian) (65-66% ZrO ₂)	£19 per ton c.i.f.

ASSISTANT MINE SURVEYOR required. Write giving full particulars of qualifications, experience and salary required to the Manager, Geevor Tin Mines, Ltd., Penzance, Cornwall.

EXPERIENCED ENGINEER with mining degree, aged 35-50, required by large Mining House as their representative in East Africa, with headquarters in Nairobi.

Home leave, with passage paid, after 2½ years' service. Salary according to qualifications and experience. Knowledge of East Africa desirable. Write giving full particulars to Box No. 1002, c/o. Charles Barker & Sons, Ltd., Gateway House, 1, Watling Street, London, E.C.4.

COLONIAL OFFICE MINERAL RESOURCES DIVISION, London, S.W.7, require **SENIOR SCIENTIFIC OFFICER** or **SCIENTIFIC OFFICER (Chemist)** for analytical and investigation work on minerals and mineral products. Quals.: 1st or 2nd Class Hons. in Chemistry or equiv. Experience in mineral analysis, spectrographic analysis or modern physical methods of inorganic analysis an advantage. Male candidates under 26 should have done or be exempt from National Service. Salary according to age and experience in scale S.S.O. £1,135-£1,345, S.O. £605-£1,055. Women's scale in accordance with Equal Pay Scheme. 42 hours. 5-day week. Candidates could, if eligible, compete for establishment through C.S. Commission or F.S.S.U. Superannuation if preferred. Forms from M.L.N.S. Technical and Scientific Register (K), 26 King Street, London, S.W.1, quoting F.328/7A.

CABLE BELT CONVEYOR, width 36 in., length head to tail drum 3,067 ft., lift 360 ft., speed 250 f.p.m., capacity 300 tons p.h., 150 h.p. motor. Available August. For full specifications apply to Logan, Great North Road, Muir of Ord.

MINE SURVEYOR (metal) required by **GOLD MINE** in **TANGANYIKA**, preferably mining school trained with overseas experience. Salary according to experience; free accommodation passages, medical attention; tours 30 months, healthy climate, generous leave; pension scheme.

Apply giving age and full particulars to Personnel Officer, Colonial Development Corporation, 33 Hill Street, London, W.1, quoting Serial 312.

MINING ENGINEERS, GEOLOGISTS AND METALLURGISTS

interested in making contact with established Canadian mining companies

with a view to employment are invited to write to

CANADIAN METAL MINING ASSOCIATION

Room 335
12 Richmond St. East
Toronto 1, Canada

The Association will be pleased to furnish information concerning mining companies in Canada to which enquiries about employment opportunities can be directed.

Enquiries would be welcomed also from trained and well-qualified mechanics, machinists, electricians and tradesmen.

EXPLOSIVES ENGINEER required in N.C.B.'s Production Dept., at London H.Q., to be responsible to the Board's Chief Explosives Engineer and, initially, to advise on the installation of alternatives to explosives for the purpose of producing large coal and to follow up and report on trials. Considerable time will be spent in the coalfields on underground investigations. Wide experience in the use of explosives and all methods of blasting and of modern coal-mining methods is required; a degree in mining would be an advantage.

Appointment (superannuable) according to qualifications and experience, but not less than £1,750. Write, stating age, education, qualifications and experience, to National Coal Board, Staff Dept., Hobart House, London, S.W.1, marking envelope X.799/H, before July 17, 1957.

A SENIOR MINING ENGINEER

aged 30-40, required for a new alluvial mining project in West Africa. Candidates should hold a Degree or Diploma in Mining, and have had several years' experience in the field of alluvial mining operations. Duties would comprise supervision of milling operations. Salary in the range £1,600/£2,000 per annum; 15 months' tours followed by three months' home leaves; free furnished accommodation; first-class passages and free medical services; contributory pension scheme; free life assurance.

Applications, which will be treated in strict confidence, should contain full personal details and also qualifications and experience, quoting reference S.4—Write Box 596, The Mining Journal Ltd., 15 Wilson Street, Moorgate, London, E.C.2.

